1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

and making almost vertical short cuts to save time and distance.[1] He generally runs when going down hill. He carries no extra clothing while travelling, nor any blankets, simply a small supply of concentrated food in his scrip and what arms and ammunition he can afford, as well as a cane with a spiked tip, generally of European manufacture, on which to steady his rifle while firing. Now that rifles are no longer carried, the cane persists as a walking stick.

NAVIGATION

The Riffians and Ghomarans, although both are essentially land peoples, take advantage of their proximity to the sea by constructing vessels and making short voyages in them. The Ghomarans take to the sea more frequently than do the Riffians.

The Riffians and Ghomarans construct two kinds of boat, the *thagharaboth*, or skiff, (see plates 5 and 6) and the *thagharaboth n jkrua'*, or sailboat. The sailless skiff seems to be commonest and is the indigenous type. Sails are supposed to have been taken over from the Arabs, although the geographical position of this coast must certainly have exposed it to contact with sail-using peoples in antiquity.

The skiff is a long narrow craft, usually about twenty feet in length, with bow and stern slightly curving upward. It is not decked over. The sides are equipped with double thole pins, *ishizh*, into which are fitted pine or cedar oars, long sweeps, *imkathafen*. It is steered by a primitive steering-oar, *demam*, held against a peg on the right stern.

This type of boat is made of cedar or pine, all hand-adzed, and caulked with tar, thickly smeared all over the hull so as to make the entire boat black in color. Pegs are used along the keel and gunwales; in order to strengthen the hull the planks are tied together with ropes through holes drilled near their edges and well plugged with hemp and tar.

The design on the boats is a simple right-angled zigzag in red paint, running horizontally near the bow. There is no trace of an eye motif on the bow, unless this be one.

Skiffs are used everywhere along the coast, but sailboats are employed less commonly and only at the better harbors. There is a single mast, called *sari*; the sail, *er krua'*, has no boom, but is attached to the mast by a long diagonal spar in felucca rig.

Skiffs are used in fishing with a net, and sailboats for fishing in the deep sea with hooks. The sailboats are likewise used for what slight coastal trade exists, and for carrying eggs and other products to Tangier and Gibraltar.

Shipbuilding was carried on, until the recent war, at the ports of Mtiwa and Ghomara, where cedar and pine were available near the shore. Since the war this shipbuilding has ceased, and the sailors buy second-hand European boats to replace those which they lose or discard. There are still plenty of native-built boats along the coast, but another ten years will probably see the last of them.

AGRICULTURE AND THE GATHERING OF WILD PLANTS

Agriculture is the most important trait of Riffian life and culture. It is the basis of existence, and is worthy of intensive study, especially by economic botanists. The anthropologist untrained in economic botany can at best merely record the external and economic factors, while the botanist may trace the origins and successions of the plants used and cultivated.

[1] The winner of the most recent Olympic Marathon was a Riffian, el Wafi, of the Beni Urriaghel.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

241 Riffian acquisition of vegetable food may be divided into four processes, some of which may be developmental stages, and all of which are in contemporaneous use.

1. The gathering of edible wild plants.
2. The care of fruit and nut-bearing trees and of vineyards.
3. The care of gardens.
4. The cultivation of grains and leguminous plants.

The following subjects also pertain to agriculture and vegetable food-getting.

1. A calendric cycle of agricultural events.
2. Tools and machinery.
3. Communism in agriculture.

222 137 **Collecting and Gathering.** There are certain wild products growing on mountains, in valleys, in springs, and on refuse heaps, which are of food value and are collected and eaten, either from choice or as emergency rations in time of famine, although no attempt is made to cultivate them. So far as can be determined, they are as follows.

azemmur,[1] the wild olive.

erbejuth,[1] the oak. Both acorns and the tree upon which they grow are called by the same name.

adheman,[1] the hawthorne. The haws, called *saaror*, are gathered and eaten.

larnej,[2] a wild lemon tree, probably escaped from cultivation.

tuth,[2] the mulberry, at present wild. It was probably introduced earlier and then abandoned.

[245] *habb ul muluk*,[2] the wild cherry, with probably the same history as the mulberry. Both trees are now cultivated by the Senhaja.

sasanu,[1] the arbutc, or strawberry-tree. Its fruit is eaten fresh, also dried and put into bread.

thabgha,[1] wild blackberries.

tuzzelt,[1] a bush the pod of which is eaten.

thakhfar,[1] a wild rose, the pod of which is eaten.

askum, wild asparagus.

ma'iisha, the wild tomato, found in old refuse heaps. Its cultivation has been abandoned.

thebisesth,[3] a plant growing in the mountains, eaten as a green.

yanush, watercress, or a very similar plant.

theshiuma, another water plant, growing in springs.

thafa ikshuth, a wild plant resembling celery.

thighigheshth,[4] a wild plant the roots of which are boiled and used for washing wool. Its leaves are cut up, boiled, and eaten.

benaaman, a wild poppy. Women eat its leaves, and children its buds.

imzwar, a plant resembling shamrock or clover. Its leaves, slightly sour in taste, are eaten.

tuasrin, mushrooms.

[1] See Introduction, p. 8.

[2] The wild lemon, cherry, and mulberry were not mentioned in the Introduction because they are not indigenous.

[3] This is perhaps related to the root given by Laoust (p. 506) for mallow. *Tibidas*, in the Zemmour dialect, is the closest.

[4] Laoust (p. 30) suggests that this may be *Saponaria rucaria*.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

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for several weeks. At the end of this time the poison is supposed to be washed out, and the product is dried and eaten.

thinifn, peas, *ibauen*, broad beans, and *er athis*, lentils, like *shasana*, are grown as grains.

241 805 793

The Calendric Cycle of Agricultural Events. Agriculture in the Rif and in the Senhaja country is conducted on the basis of the old Roman calendar, the names of the months surviving in a form very little altered from its original character. I was unable to transcribe these names exactly since I could find no one who knew them accurately and was willing to reveal them. Knowledge of them is confined to the *fkih*, the preceptor or religious head of each group of villages, and to his students. The *fkih*, while delivering sermons at the mosque on Fridays, reveals the agricultural program for the following week and tells the farmers just what activities the season merits. To reveal this calendar system and the agricultural annotations which go with it would be to relinquish a portion of the awe in which the religious leader is held.

The preceptor likewise knows the Arabic lunar calendar and is the only one able to tell when religious feasts of Arab origin are due. The farmers reckon only by the four seasons, a solar conception which may well antedate either the Roman or the Arabic system. They know, however, about when each activity is due, since they are in the habit of repeating the program every year. and could probably get along as well without the learned assistance of the *fkih* as with it.

241 805

A rough outline of the year's activities follows.

January. In this month the farmers plough their land. (See plate 9.) When this has been finished they sow barley and *shasana*, and later broad beans and lentils.

February. If the bean and lentil sowing has not been finished in January, it continues over into early February. Sometimes it continues until the end of the month.

March. About the first of March the farmers hoe the mountain slopes and sow rye and peas.

April. On the first of April they commence planting the vegetable gardens with potatoes, beans, carrots, turnips, onions, and peppers.

May. This is the month for trees. The farmers dig around the roots, fertilize them with manure, and water them. After the trees have been cared for in this way and pruned, the soil about the grapevines is loosened and fertilized with manure, without water. At this time the grapevines are also pruned.

June. Toward the beginning of June, or sometimes during the last week of May, the farmers reap the *shasana*, lentils, barley, and peas, in the order named. The barley is cut with sickles; the others are pulled up by the roots and laid aside for threshing. After this has been done the farmers irrigate the terraces in which the *shasana*, lentils, peas, and barley have been growing (see plate 9) and plant them with maize. The plants previously reaped are then threshed, first the *shasana*, which is the most susceptible to insect pests and cannot wait, then the lentils and peas, and finally the barley. All this threshing is done with cattle, donkeys, or mules, which are forced to trot around a circular threshing floor. (See plates 10 and 11.) Toward the last of June the rye is cut, and the women thresh it by hitting the heads of the sheaves against sticks held in the hand. It is tabu to thresh rye with cattle, just as rye is never planted by means of domestic animals or the plough. The whole rye complex seems to antedate or at least to be negatively associated with the cattle and plough complex.

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July. In July, forty-five days after having planted the maize, the farmers reap it, fertilize and water the terraces, and set out the second crop. This second maize is a different variety from the first, and grows more rapidly. After it has ripened it is left in the ground until December or January, when it is removed in time for the next season's ploughing. Towards the end of July the almonds and walnuts are picked and stored away.

August. About the first of August, after the second crop of maize has been planted and the almonds and walnuts picked, the farmers gather the turnips, potatoes, and small beans, planting in their stead more potatoes, more turnips, and black beans. They likewise set the onion seed out in beds, and after the shoots arrive cover them with manure and branches to keep them warm during the winter. Toward the last of August the late figs are picked, split, and set to dry. Figs intended for sale rather than for local consumption are not split, but are spitted on sticks of wood. At this time the farmers also pick pomegranates and carob beans.

September. September is the grape season. Whole families repair to the precipitous vineyards with baskets to pick, sleeping in the vineyards at night, and feasting and playing games. This is the season of festival, and likewise the time when weddings take place. At this time, when the families are sleeping in the vineyards, raw garlic is eaten plentifully, since this is the only time of year in which people do not live in the house, and it is considered shameful to have an odor of garlic about the house. After the grapes have been picked the women gather the root called *fathis*, which they burn. The ashes, mixed with water, are used to wash the grapes before these are set out to dry. Grapes washed in this way are said to dry more rapidly, not to rot, and to form better raisins.

October. Toward the end of October the olives are picked and stored away packed in salt until the farmers find leisure in which to grind them. Olives can be kept two years in storage without detriment.

November. In November the farmers graft trees, using beeswax in the process just as it is used among modern farmers. They tie the waxed joints with cloths, which they leave on until the following spring. In October and November the men cut wood and brush for their fires, enough to last them through the winter. The women and children help them to bring this wood in on their backs.

December. Toward the end of this month and in early January, those farmers who possess orange trees pick the fruit. Some of it is eaten, but much is sent to Fez to be sold. During the winter months, when it is stormy outside and farming is ended, the men sit inside the house working with wood, fashioning spoons, hoe-handles, and ploughs, and do what repairing is necessary upon their houses.

This calendar of events keeps the Riffian farmers very busy most of the time, and as a rule they are most industrious and energetic workers.

In the regions where there is no terraced irrigation (left white upon map 2[1]) only one crop of maize is grown, and but one crop of vegetables. This is compensated for by the relatively greater abundance of arable land in the east and other low-lying districts. The mountain people depend to a great extent upon vegetables, especially the leguminous varieties, and dried fruits and nuts, while the lowlanders go in more extensively for wheat and barley.

[1] See p. 52.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

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Tools and Machinery Employed in Agriculture. *ariyzim*, the hoe, or mattock, is the fundamental Riffian agricultural implement. It is made by local blacksmiths and resembles the hoe used all over North Africa and far into the Negro country. The present hoes are hafted in the normal European fashion, but there is some reason to believe that they formerly were socketed. The only difference between a hoe and an adze is that the adze is smaller, more delicate, and has a steel blade welded into the cutting edge. The distribution of the hoe is universal.

amzhar, the sickle, is of ordinary European shape and type, and is made locally by smiths. It is hafted by a tang. The distribution is universal.

er hathitha, the reaping hook, is a short sturdy knifeblade, hooked around to form a right angle about two inches from the end. It is tanged and hafted into a wooden handle.

asghar, the plough, is typical and almost as widespread as the hoe; this is a composite implement, made, except for the iron share, wholly by means of the adze, and by the farmers themselves rather than by carpenters. Any farmer who shows himself proficient in this art may be called upon to make ploughs for his neighbors, but he cannot or does not accept money for this, on account of the sacred quality of the plough. The parts comprising this implement are as follows:

zegru, the body of the yoke, a double curved piece of wood which sets across the necks of the two oxen drawing the plough.

thighenayin, the hames, two U-shaped pins, one at either side of the *zegru*, passing under the necks of the oxen and fastened through holes in the *zegru*.

ashbiu, a piece of leather nailed onto the centre of the *zegru* to hold the hooked end of the plough-pole in place and keep it from slipping.

thazhbat, the wooden peg set in the end of the pole of the plough itself. This peg fits over the middle of the yoke and is held in place by the leather *ashbiu*.

athemun, the long pole of the plough at its rear end set into the body of the plough and at its front end hooked onto the yoke by means of the *thazhbat*.

siri n wusghar, the main body of the plough, a thick curved piece of wood, so hewn that its back rises to form a handle and its front is the part to which the share is attached. The *athemun* is set into the middle of the *siri*.

thafarot n wusghar, a stout wooden peg running vertically, mortised into the *siri* and running entirely through the *athemun*. This prop serves to keep the *athemun* and the *siri* tightly in position.

imzoghen n wusghar, the ears of the plough, two triangular pieces of wood set into the sides of the *siri* just back of the share.

thayasa, the iron ploughshare, made by local blacksmiths. This share is made from a flat piece of iron hammered over at the edges so as to form a socket, which fits over the pointed end of the *siri*.

The *siri* and *thazhbat* must be made of oak; the *athemun* may be made of oak or of cedar; the *thafarot* may be made either of oak or of almond wood; and the *imzoghen*, which need not be very strong, may be made of any available kind of wood.

These are the indispensable elements of the plough.[1] The type just described is found with no important variations all over the area in question, with two exceptions: the sterile

[1] An excellent and exhaustive treatise on Moroccan plough types will be found in Laoust, pp. 275-290.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

241 portion of Beni Bu Yahyi, where no agriculture is practised, and parts of Ktama, where wheat and barley are not or cannot be grown.

252 [376] *Ihasath n seman*, the turbine grain mill. This type of mill, a complicated mechanical invention, consists of a small house built over a dam or over the end of a high-flowing irrigation ditch, a turbine wheel with tilted paddle-shaped blades set into a thick terminal hub, a circular stone attached to the upper end of the turbine shaft inside of the house and resting on the nether stone, and a hopper hanging above the stone with a feed-slot jiggled by the upper stone so as to insure the flow of grain from the hopper. The hole in the upper stone

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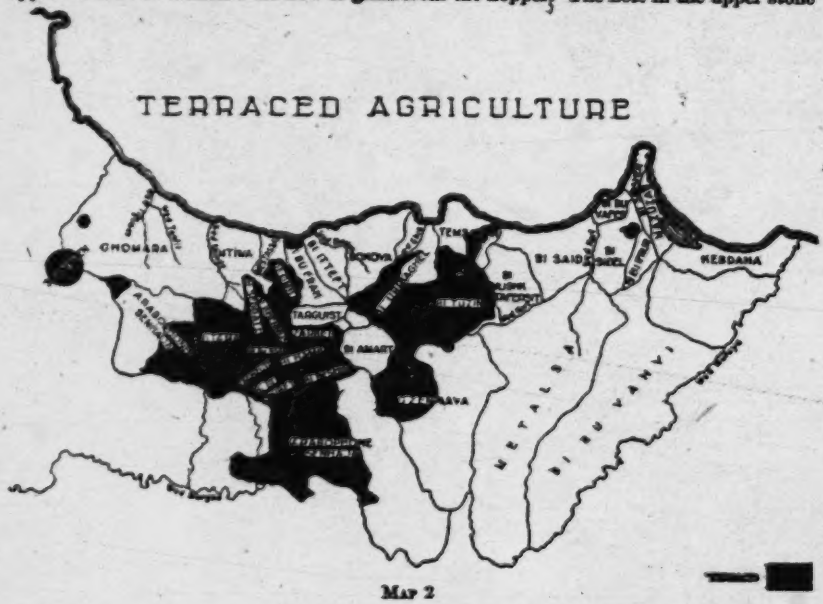

MAP 2

into which the shaft is set is off-centre, and the upper part of the shaft is bent to allow for this, so that the upper stone turns fairly evenly on its axis, while a second hole, drilled through the exact centre of the upper stone, does not deviate from the centre and allows the grain falling from the hopper to be ground between the two stones. The lower stone is larger than the upper and is rimmed with a slightly raised border, broken only in one place, so that the flour may be extracted from the gap in the rim. This type of mill seems to be concentrated at Taghruth, where many of them are in constant use. There are several in Beni Bu Nsar and five or six in Beni Aissi of Ktama; there was formerly one in Wed Iherrushen of the Gsennaya; and there are about ten at Ajdir. At Fez many of these mills are in use, and they are also found in the Atlas, particularly at Zerekten.[1]

[1] For a detailed description of this type of mill consult Laoust, pp. 36–43, and Baron Nopsa's *Boutes, Tsuhine, Gerste Nordafrikanisma*, pp. 131–134.

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Threshing with mules, Tiguisas, Ghomara

Winnowing, Tiguisas, Ghomara

Husking grain in a mortar, Tiguisas, Ghomara

Winnowing out the husks, Tiguisas, Ghomara

[facing p. 52]

1: Coon E-5 (1926-1927) 1931 MX3 RF MX3

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

312 construction requires a great amount of skill. Where the sides of the valley are precipitous and rocky, the ditches are led around through olive logs hollowed out with the adze and supported by long wooden props; at times ditches are led even from one side of the valley to the other by means of these olive-wood troughs. The distribution of the *targa* coincides with that of *tikerathin*, or terraces, except in the lowland alluvial plains of Ajdir, Tiguisas, and other Mediterranean deltas, where irrigation is carried on without terraces. Irrigation is locally supposed to have been invented by the men of Iherrushen and Ikhuanen in the northern Gzennaya, and expert *targa* makers from these places are sent for to construct and repair ditches all over the Rif.

[463 465] *hassi*, the well. Wells are constructed by itinerant craftsmen from the region of the Draa, who wander about throughout the Rif seeking employment. They are never molested, since they are considered benefactors of mankind, and are paid well for their work. These men generally earn as much as twenty dollars for the construction of an average well, and find employment chiefly in flat arid country where there are no springs and where wells are a necessity.

241 735 476 **Communism in Agriculture.** The Riffians, living as they do close to the soil and often not distantly removed from the prospect of starvation, have developed several social devices whereby the poor may be prevented from perishing and the rich compelled partially to support them. These charitable practices are so ingrained that no one able to act as a benefactor to the poor would venture to criticize them in public or refuse to take part in them. They concern the three vegetable products which seem most deeply entwined with Riffian life: rye, grapes, and olives.

When a man wishes to sow rye on a mountain slope, he invites as many men as wish to do so to help him. Most men who have nothing else of importance to do accept the offer, and no one refuses without an adequate excuse. In this way a man of moderate means is assured of a plentiful crop of rye, to make up for his lack of other foodstuffs.

The crew works diligently from sunrise to sunset, after which they climb downhill to the house of the owner of the rye. The latter's womenfolk have meanwhile busied themselves preparing as ample a meal for the workers as the family's means will allow, and all eat and spend the evening together. If the family cannot provide very abundant rations, the workers seldom complain, since they consider their participation in the work as a form of charity, and their partaking of the food as a social gratification to the providers of it.

Similarly, in reaping season, anyone who wishes may come unbidden and help gather in the grain, whether it be rye, barley, or wheat, and is assured of an adequate meal at the end of the day in payment. In this way people who have finished their own work may be fed without drawing on their own supplies. Gleaning is left to the poor of the village.

241 476 If two farmers who own adjoining fields or terraces possess each but a single cow, they yoke these together and plough their land in common. No family is without a cow, and since ploughs are constructed by the farmers themselves, or by neighbors especially adept at the art, without payment, the situation of a man with land and no cow or plough does not arise.

241 312 Irrigation ditches which water the tillage of more than one man are subject to communal care. Each farmer is assigned a definite amount of water during each season when it is required, the amount depending on the amount of land requiring irrigation. The water is measured by days and half-days. Each season the farmer must send out a man for every

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

241 312 day's water he receives, to work a day repairing the system after the heavy rains. Farmers who have each but a half-day's water pair off and draw lots to see which will work, since no one is allowed to work half a day only.

241 735 476 At the arrival of the grape-picking season, all the poor families who have no vines and the rich landowners who have many, assemble in the village mosque, on a Sunday, chosen for this occasion because it is considered a lucky day for grapes and supposed to be immune from thunderstorms. Before this date no one may pick grapes. The local administrative council, which has summoned the families now present before it, assigns to each rich family a poor one, all members of which are to help the vine owners. The aides thus chosen assist the others in picking their grapes, washing them in *fathis* ash and water, and in setting them out to dry. No group may begin picking until all assignments have been made. After the work is done and the raisins have been dried, the rich family gives its helpers a generous quantity of the raisins. There is no set rule dictating how much shall be given, but the families benefiting from this form of charity seldom have cause to complain. If after the allotment of families there are some poor ones still remaining, the council sets them to work picking the grapes which are the property of the local mosque or saint's tomb. The workers who pick and cure these grapes are given a fourth of the product.

241 735 All the olive trees in a village, although owned by a number of different individuals and by the mosque or by a saint's tomb, are located together on the banks of the nearest stream, below the lowest terrace. The shaded area beneath the trees is a place for various types of gatherings, one of which is directly concerned with the trees themselves. When the olives are ripening and windfalls begin to collect on the ground beneath the trees, the administrative council sets the first Friday of this season as the official day for gathering them. Early in the morning most of the families, especially the poor ones, come to the olive grove and await the arrival of the council members. The latter give the signal to start, upon which the people rush under the trees and gather up the windfalls. They are not allowed to touch any olives on the trees or to start before the signal is given.

252 471 Each olive tree owner's name is written on a list in the possession of the *adl*, an officer comparable to a town clerk. A farmer is allowed to use the grinder and press, which are communally owned, only when his turn has come around. He may employ it only for a certain number of days, depending on the amount of olives his trees are capable of producing. In this way he is prevented from idling or wasting his time at the press. During the time he 252 is there, he is required to give one cup of oil each day to each of the following:

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1. The *fkih*, who keeps half of it for his personal use and saves the rest for the lamp in the mosque. This is called the cup of the mosque.
2. The *mokaddem*, or caretaker, of the mosque, who collects a cup to be sold or stored, the proceeds to be reserved for hospitality, cartridges for the village, and fines imposed upon the whole village. This is called the cup of the grinding wheel.

[872] 3. The students in the local primary school, who collect a cup which they sell or consume as food. This is called the cup of the students.

[878] 4. If there is a saint's tomb in the territory of the village, a fourth cup must be given it for its lamp.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

252 Any oil remaining over the three or four cups so given is the property of the man who
[735] has pressed it, unless a poor man without trees comes to the press and asks for some. Such demands cannot be refused and each suppliant must be given a cup.

● 241 Besides charitable assistance and work done in anticipation of remunerative charity,
465 there are two types of definite agricultural contract by which one man who has not enough land to support himself and his family may acquire sufficient provender to last his household through the winter. The first is that by which a poor man binds himself to assist a richer farmer in all agricultural tasks in which he may engage. In return for this he receives a fifth of the total grain crop, a fourth of the leguminous plants and vegetables harvested, a third of the product of the fruit, olive, and nut trees, and a third of the grapes.

The rich farmer hires these share-laborers (who are called *akhemes*,[1] plural *ikhemesen* or "fifths," because of their return in grain) because he is not able to care for all of his land himself, owing to its extensive size. If the property of a rich farmer is so extensive that he is unable to cultivate it with the aid of one share-laborer, he will hire two, and these will split a fifth, a fourth, and a third of the various types of produce. No matter how many men a farmer employs he never gives more than the stipulated fractions, which are equally divided among the workers.

241 When a man owns property which he has no intention of working himself, he can rent it
427 out in return for one half of the produce. This type of contract is used by the Beni Bu Yahyi in renting out the northerly portions of their territory to farmers who come down from Galiya to work the land, the Beni Bu Yahyi not being as interested in agriculture.

241 The share-laborer is often a stranger in the village of his employment, having left his
166 home through shame of having his poverty advertised in his own village, or more often through fear of punishment for some crime. The migrations of these share-laborers has done more to cause infiltrations of blood from tribe to tribe than any other factor, since the immigrant usually marries into the group of his adoption.

241 Wealth is not a stable thing in the Rif, any more than it is in more modern types of
556 society. Despite charitable practices and opportunities for outside work, many families find themselves on the verge of starvation in or near January and February, and are willing to sell anything within reason to obtain enough food to last them until the next harvest. Others, more industrious, who have worked their land to its limit and spent the rest of their time helping others for pay, may have more food than they require and be willing to sell some of it, at a premium. They generally demand land in payment. Working this land to its limit the following year, they may pile up an even greater surplus than before, and thus before many years may become large landowners and relatively rich men, ready, in their turn, to hire as share-laborers the people from whom they bought the land.

[558] Thus the retention of property depends upon whether or not it is worked diligently, and positions of wealth may be reversed in less than a generation.

FOOD PREPARATION AND EATING

252 The different types of food, including their methods of preparation, may be classified as follows: (1) cereal preparations antedating bread, (2) bread and breadmaking, (3) preparation of vegetable products alone, (4) dishes containing meat, (5) fish, (6) eggs, (7) milk and

[1] The feminine form of this word signifies a political division. See p. 92.

789 [95] He who hears something bad may also neutralise the evil influence by wetting his finger in the mouth and then closing his ear with it (Aglu, Igliwa); among the Ait Waryager he puts the little finger of the right hand into the left ear. Again, if a person hears something good he damps his finger—among the Ait Waryager the forefinger of the right hand—with spittle and then puts it into his right ear (Amzmiz).

825 776 778 [97] The noblest of all animals is the horse, and there is much baraka in it; it is of high blood (d-demm l-kbir); it is like a shereef. It gives blessing to its owner and his house. He who owns a horse has other animals as well, and corn and money and anything he wants; l-hail u l-hair wahed, "horses and prosperity are one" (Ulad Bu'aziz). To have a horse is as meritorious as to entertain forty scribes in the mosque (Ait Waryager). The sayatin, or evil spirits, avoid a place where there is a horse (Tangier, Ait Waryager). When it neighs it puts them to flight (Hiaina) or breaks the heads of forty evil spirits (Ait Waryager); it says, L-haer liya u l sidi, "Prosperity for myself and for my master" (Hiaina).

[103] Contrary to all other dogs, which are regarded as unclean, a greyhound, which is used in hunting, is considered to be possessed of baraka. A house to which a greyhound belongs is never haunted by jnun (Tangier, Ait Waryager).

824 778 241 [105] As certain animal species so also certain species of the [106] vegetable kingdom are possessed of baraka. This is above all the case with corn, especially wheat and barley, and anything made of corn, such as bread and seksu. The profession of the faith is written on every grain (Ait Waryager). It is the baraka of the corn that has given rise to most of the rites connected with agriculture, and of these many more are found in connection with the growing of wheat and barley than with that of other cereals, pulse, and vegetables; though the vegetable garden is also treated as a holy place.

824 778 Fruit-bearing date-palms are holy. This is probably an old Berber idea, since the date-palm (Arab. nahla; Berb. ainiu or tainiut [Igliwa], tini [Temsaman]) has been known to the Berbers from a very ancient period; but it was also a sacred tree in ancient Arabia. Another holy tree, like- [107] wise held sacred in the East, is the olive (Arab. s-sejara de z-zeit un; Berb. tazzitunt [Igliwa], zzeitun [Temsaman]), which seems to have been already cultivated in Northern Africa in prehistoric times. It is said that it has one of the names

796 In many parts of Morocco certain eating ceremonies take place on Midsummer day.

[193] The Ait Waryager make imsihan (the Arabic siyoha) by boiling wheat which has been soaked over night, and adding to it salt, as also butter if they have any.

796 787 821 [206] The forty days between 12th July and 20th August inclusive (Old Style) form the period of s-smaim, or "the great heat". It is a time of omens. Thunder in the smaim is supposed to indicate sickness or death among men or domestic animals (Fez, Hiaina, Tsul, Andjra, Bni 'Aros, Ait Waryager).

In Andjra continual east wind in the smaim is taken for a sign of much rain in the earlier ploughing season, whilst the Ait Waryager expect a wet ploughing season if there is much west wind in the smaim.

[208]

RITES AND BELIEFS CONNECTED WITH AGRICULTURE

241 The first ploughing season nominally commences on 17th October (Old Style), but the ploughing may begin earlier or later depending on the autumn rains, which must first soak the ground. It is called in Arabic hart l-bekri, l-hart de l-bekri, or simply l-bekri; and in Berber dayarza damanzuit (Ait Waryager), tayaza tamanzust (Temsaman), taharratt umenzu (Ait Nder), amenzu (Ait Yusi), amenzui (Amanuz). During this season wheat,(1) barley (2), beans (3),

1. In Arabic gemah or gmah, and, in Northern Morocco, by preference zra', a word which farther south denotes both wheat and barley; in Berber irden (Shloh), erden (Ait Yusi), erden (Ait Waryager). On the wide extension of this Berber term see Laoust, op. cit. p. 265 sq.

2. In Arabic s'er; in Berber timzin (Shloh), tumzin (Amanuz), timzin (Ait Yusi), a term which is very widely used in North Africa (Laoust, op. cit. p. 264). I have not, however, found it in the dialects of the Rif, where the word for barley is imendi.

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3. In Arabic ful; in Berber ibaun (Shloh, Ait Yusi, Rif dialects), ibawen (Ait Waryager). See also Laoust, op. cit. p. 268.

peas (4), and lentils (5) are sown; but where irrigation prevails

4. In Arabic jelban; in Berber tinifin (Shloh), tinaffin (Amanuz), dinifin (Ait Waryager), jjilban (Ait Yusi). See also Laoust, op. cit. p. 269 sq.

5. In Arabic 'ades; in Berber tiniltit (Amanuz), l'ads (Ait Yusi), ra'des (Ait Waryager). See also Laoust, op. cit. p. 269.

[209] beans may be sown before the rains, a sowing which in Fez is called t-t aqser and among the Ait Yusi ibaun imenza, "the early beans". There is a later ploughing season—called in Arabic l-mazozi or l-hart de l-mazuzi, and in Berber dayarza damazuzt (Ait Waryager), tayaza tamazust (Temsaman), amazuz (Ait Yusi), tigira (Amanuz)—when the same kinds of cereals or pulse are sown.

[210] On the day when the ploughing commences certain rites are performed in all parts of Morocco.

[215] Among the Ait Waryager, immediately before the ploughing begins, the owner of the field has a dish of seksu and fowl prepared in his house. Part of it is eaten by him, his family, and the ploughman (if he does not plough himself), while the rest is sent to the village mosque to be eaten by those who happen to be there. When they have finished the meal they make fatha and invoke blessings on the future crops.

Among the Ait Waryager the ploughman, when he puts the ploughpoint (dagarsa) into the ground, curses the devil by saying, Allah ina'lek ya ssitan raharami, "May God curse you, O Satan the villain"; or, still better, expels him with the phrase, Misbillah arrahmani arrahemi, arrahemi, a'udu bi llahi mina assitani arrajemi, "In the name of God the merciful the compassionate, I take refuge with God from Satan the stoned one".

[218] Among the Ait Waryager, if a bull, cow, or mule is not good at ploughing, it is taken three times round a saint's shrine, after

241 which a little bag containing some earth from the shrine is hung on it, and the farmer promises to give a present to the saint if the animal improves.

The ploughman, who is called in Arabic l-harrat or l-hammas and in Berber aharrat (Ait Nder, Ait Yusi) or ahammas (Ait Warain, Ait Waryager), is subject to certain rules the transgression of which is supposed to injure the crops. It is considered necessary that he shall be sexually clean; if he has had intercourse he must wash himself before he commences his work, since otherwise there would be [219] no baraka, or holiness, in the seed or there would grow mostly grass and weeds on the field.

[220] In Andjra the seed is likewise kept carefully apart from other grain; and both there and elsewhere (Garbiya, Ait Waryager, Temsaman, Ait Yusi) it is believed that if a child or unmarried person passes ahead of the sower so that some of the cast seed touches him or her, that person will never marry—"the bas will remain in him till his death".

243 [227] When the reaping is finished, or also every afternoon successively as long as it lasts, the reaped corn is carried to the place in the open where it is going to be threshed. This threshing-floor of earth is called in Andjra nwader, in the Hiaina nader, in the Garbiya and among the Ulad Bu'aziz, as also among other Arabs of the plains, ga'a; and among the Berbers anrar (Aglu, Amanuz, Demnat, Ait Yusi, Ait Nder), anrar (Ait Warain), andra (Temsaman), annar (Ait Waryager), arnan (At Ubahti), rrhabt (Ait Sadden). Two stacks are made there, one of barley and another of wheat, unless indeed there happen to be different kinds of wheat which the owner wishes to keep separate.

[229] The corn is generally trodden out on the threshing-floor by animals—horses, mules, donkeys, or in some tribes, e.g. the Ait Nder, by oxen. The wheat is commonly subjected to this process a second time, if there is any considerable quantity of it, in order to be cleared of the husks which may still cling to it; but the barley is threshed first so as to supply the animals with fodder.

[232] The heap of ready threshed corn—which is called in Arabic saba, and in Berber tirrit (Igliwa), tirst (ibid., Amanuz, Aglu), tirrst (Ait Nder, Ait Yusi, Ait Sadden), tirrejt (Ait Warain), dirrest (Ait Waryager), tiarrest (Temsaman)—is protected against jnun by salt (Hiaina, Andjra, Ait Waryager, Ait Warain, Igliwa), tar

3: Hart E-5 (1953-1954)1954 MX3 Rif MX3

The population density, 65 individuals per sq. km., although not the highest in Spanish Morocco, is a greater number of people than the land, which is one of the most infertile in the Protectorate, can effectively support. In the last century the Aith Wuryāghil found blood-feuding a sure outlet to reduce their overpopulation, but, at, the present time, as they are no longer allowed to carry firearms, the population problem is met by a large annual exodus of ablebodied tribesmen to the plains of western Algeria, where they help out with the barley, wheat, olive and grape harvests on the farms of French colons. The terrible drought in the Rīf in 1945 precipitated emigration to a previously unheard of degree, and today the number of people from Aith Wuryāghil who are living and working outside the Rīf is greater than ever before.

Those who stay at home follow an annual agricultural cycle in which cereal cultivation is extensively practiced, particularly that of barley. They plow and sow their fields in the autumn and winter, and reap and thresh the grain the following summer. The straw is piled up into circular, conical silos (*athmūn*, pl. *ithmūnen*) to be used in the winter as fodder for the animals, of which cattle and goats are the most important, sheep less so. Mules and donkeys are employed as beasts of burden, while horses, owing to the extreme poverty of the people and the mountainous configuration of the terrain, are virtually non-existent. All, without exception, keep chickens and, inevitably, dogs, while in certain favored areas apiculture is practiced; the bees of Jabal Ḥammām produce the finest honey which it has ever been my good fortune to sample.

Although barley is the most important cash crop (the barley harvest of 1953 was the best on record), the Aith Wuryāghil spend comparatively little time working their grain fields, not more than three or four months a year, all told; it is their trees which receive the bulk of their attention. The most common trees are fig, pomegranate and almond in the Bay of Alhucemas, with olive substituted for pomegranate in the mountains; they are all pruned, watered, grafted and fertilized with great assiduousness, for dried figs and almonds constitute the principal food reserves during the winters, after the grains have been eaten. The same is true of raisins, and the cultivation of grape vines is extensively practiced in the mountains near Sūq al-Arbaʿ of Taurirt.

3: Hart E-5 (1953-1954)1954 MX3 Rif MX3

near Sūq al-Arba' of Taurīrt. Olive oil, extracted from a communally owned olive grinder and oil press, is the essential fat (1).

The fields, orchards and vegetable gardens (the latter producing broad beans, chickpeas, potatoes, onions, tomatoes, peppers and carrots, to mention only a few) of the Aith Wuryāghil are usually terraced near the houses, along the slopes of the mountains. The vineyards, whither the families repair in September to pick grapes, are further up; and along the crests are the communal goat pastures and the *ghāba* patches, where the women go to cut brushwood for their ovens and for the local mosque. Grape picking is the only important activity in September, which marks the end of the agricultural year; after this is done and after the barley has been reaped and threshed and the silos piled up, people make merry and get married before the first rains begin again and the time to plow and sow has started up once more.

Herding and agricultural contracts of a verbal nature are made between the wealthier and the poorer men of the community, those who have little hiring themselves out to those who have more (2). Individuals who own more animals than they can pasture themselves hire herders who, while the beasts are in their charge, receive all the milk and butter and half the young ones born, and, when the animals are sold, half the profits; if the contract concerns sheep, they receive half the wool as well. Vegetable gardens and orchards are cared for by hired gardeners *(rabbā')* who receive one-fourth of the fruit and vegetable crop; as their job entails setting up terraces, they sometimes get one-third of the vegetables if the land is difficult to work. These same men, if they also perform all the operations necessary for cereal cultivation, are called *ikhammāsen* and receive one-fifth of the barley and wheat crop. The owner of the field supplies the seed, the animals (usually cows) and the plow as well in this type of contract, while the *akhammās* (sing. of *ikhammāsen*) provides only his muscles and a switch to keep the cattle moving while they are under the yoke. The *akhammās* contract is the most

(1) Coon, Carleton Stevens: **Caravan, The Story of the Middle East**, New York 1951, p. 313.

(2) Sánchez Pérez, Andrés: **Aprovechamientos comunales y formas de cooperación en las yemaas del Rif, Africa**, Madrid, Noviembre 1947, pp. 75-77.

000 31--"Abandoning" is hardly the proper term, although we do know of a few cases in which this has actually happened. "Divorcing" is probably what is meant here.

32--The bride price varies considerably, according to the means of the persons involved, and may range from 30,000 francs up to over 100,000 (in 1960).

[671] 33--The Shari'a stipulates that if a husband goes away from home without providing for his wife and does not let her know of his whereabouts within three months, she may then divorce him. In practice, however, this three-month period is usually extended to a year, during which time the wife usually goes back to stay with her parents. She is, however, prohibited from remarrying for three months after divorce; this is to determine whether she is pregnant. If she is, [851] she must wait until her child is born before remarriage; and the child itself reverts to the father.

[114] [241] 34--Here Blanco is in error. Plowing and sowing are invariably done by men, and both operations are carried out by two men simultaneously, the sower preceding the plowman when cereal crops are planted, and following him when beans are planted.

[241] [723] [224] [226] 35--Rifian economics are based primarily on agriculture and secondarily on animal husbandry. Beside these activities, hunting (of rabbits, partridges, etc.) and fishing (only along the Mediterranean coast, and to a very limited extent) are extremely minor pursuits.

[565] [463] 36--Ironwork is carried on entirely by a debased, (largely) endogamous and (largely) propertyless social class of people called imziren (sing. amzir, "blacksmith"), almost all of whom, in the Central Rif, originate from the tribe of the Axt Tuzin, which produces a number of other low-class social groups (in particular, imdhiyazen, musicians who play and sing at weddings and who also double as mule-breeders), all economic specialists, as well.

[178] [294] [286] 37--Women used to weave rugs on upright looms, and even jillabas (the national garment of the Moroccan male, a woollen cloak with sleeves and hood) on horizontal looms, but men have now, for at least the last 40 years, done all jillaba weaving. Sewing (jillaba seams, located in the front of the garment) is done entirely by tulba, or Koranic students.

[114] 38--Except for chickens and eggs, which are the exclusive property of women. However, again, Blanco's statement, interesting in that it comes from a Spaniard, seems a bit dogmatic and extreme.

[443] 39--In the Aith Waryaghar, women were expressly forbidden from attending markets under any circumstances, and even now only old ones, poor ones and loose ones show up on market day. However, in the same tribe, there are five women's markets (and one in the Thimsaman) to which men are equally expressly forbidden. With the segregation of the sexes [114] as pronounced as it is in the Rif, it is very difficult for a male anthropologist to find out (in other than the most general and roundabout way) what goes on at women's markets!

621
423 11) Estate: The rural estate must be considered as being formed by the funds and property which the members of the jma'th looked after and which are mentioned in Section (5) above, and those which they used in common, such as lands and fruit trees, water, brushwood, pasturage, etc., (all) comprising the patrimony of the jma'th, given the fact that all of these were administered freely by the latter, and that they originated in it and invested in it, although toward different means and ends, as we shall try to show.

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793 a) Worship: The attentions to worship, in any tribe, presented two aspects which were cared for in different ways. One was that regarding all pertaining to the mosque as a building, dhamzyidha (construction, repairs and maintenance), and the other was that of the personage who officiated within it: the fqih. The [423] resources on which both depended had the same origin: the intangible patrimony of the mosque formed by voluntary donations of well-to-do and pious individuals, consisting of lands and fruit trees, the working of which through leasing and the acquisition of graves in the vicinity of the mosque constituted its income.

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[429] The administration of these properties was the job of a lay member of the community, who was nominated by it and to which he [251] had to account. The storeroom for grain was the ghurfa (Rif. ghwarfth), the second story, or any other room of the dhamzyidha or mosque, the key of which was kept by the mqaddim just mentioned, while the fiqh was its guard.

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241
621 When plowing-time arrived, the patrimony was leased at a meeting of the jma'th, and when it was time for the harvest, each

[See p. 183--Analyst]

person took to the storeroom the share of grain which had been allotted to him.

The fqih was contracted and paid through this share of grain. The mqaddim's job was gratuitous and was reduced to the acquisition of mats, lighting, buckets, brooms, small repairs, the storing of the harvest and the payment of the fqih, with due notice given to the jma'th. For other expenses, such as additions and improvements on the building, etc., there had to be prior agreement on the part of the jma'th, i.e. acceptance of these matters by the various lineage heads.

From this simple mechanism and the character of these properties resulted their scrupulous and austere administration by lay tribesmen (author's italics), which any other procedure would have been hard put to surpass. The result was that not only were the summary needs of this sort, today unsettled, catered to, but that it was rare to find a mosque which did not possess surplus stores good for five or six years. Hence this constituted a true estate, a localistic tie which everyone voluntarily tried to improve and which today it is possible that we (i.e. the Spanish administration) have disrupted.

It has been said that our (i.e. the Spanish) occupation and action have forced the discovery and have focused upon habus (religious and/or charitable endowment) properties which were either hidden or were on the point of disappearance. In the (tribal) countryside, this is either an error or an infantilism. Not only have we (the administration) discovered nothing of the sort, but we have confused things a great deal, as anyone who reads this paper, or rather, anyone

c) Instruction: The maintenance of expenses relating to education fell and fall, independently of the above, on the members of the jma'th who, in turn, must provide the fqih with his meals, while his contract, as we have seen, depends, on the other hand, on religious property[14].

The gratuitous character of the representative jobs, such as the iziddjifen, and the eternal need to be prepared adequately for distinguished visitors (tribal authorities, personages of political, economic or religious significance, harka-s passing through, etc.) made it mandatory that the expenses incurred through the feeding of visitors (difa or diyafa, or, more commonly in the Rif, muna) be shared equally by the members of the jma'th or that they be levied by the iziddjifen at so much per head. To this end they also used to prepare reserves set aside from the harvest reaped in common from the jma'th lands as of that taken in from the leasing of these same lands, funds from which were also applied or set aside for the repair of irrigation ditches or for any other communal need which the jma'th agreed had to be satisfied. Even today this custom continues, and the ziyara donations to members of holy lineages, once the harvest is in, are effected in this fashion, with the crop taken in from a plot of land held for this purpose. Such a plot, in some jma'ath, is usually entrusted to a fqir (member of a religious order) of the jma'th (in question), who must convoke its members to plow and harvest it. For these individuals,

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14--In our own experience, both the meals of the fqih and his annual remuneration in barley depend entirely upon the resources of the members of the jma'th concerned. No doubt, however, if his annual stipend in barley can be integrally extracted from religious land (such as habus), so much the better, and nobody is the loser.

312 The
562 jma'ths agree on the amount of the fines to be imposed for infractions
[623] of these rules, especially those having to do with the freedom of
[681] women, forbidding the men either to come near them or to remain in those paths which lead to their washing or bathing sites. Ordinarily, in this case, a turn is set up for a boy to act as guard, at a prudent distance from the site, if the latter by its topographical situation or by its distance from the village renders such a move necessary.

D) Irrigation in General:

312 The utilization of water in the Central Rif, particularly
615 among the Aith Waryaghar, is the object, in both general and particular cases, of agreements between the users; these agreements are made at the beginning of the summer for those water points which have a small or intermittent flow and which are of short duration. These agree-
[212] ments are also usually unwritten, and they deal with the following points: 1) dams, 2) network of irrigation ditches, 3) repairs to ditches, 4) turns (nubth, pl. nubath) of those who irrigate, and 5) infractions and sanctions.

[466] The labor as well as the necessary repairs are done by compulsory personal service (twiza)[119] and proportional contributions
[333] on the part of the irrigators. Any ditches which need special work done on them, such as bridges or retaining dams, are previously agreed upon to be done by contract with master-masons, with the cost of the materials included.

312 Infractions are usually reduced to: 1) appropriation by anyone
689 of a turn or turns of water outside or exceeding his own, and 2)
241 differences and disputes which during the "Republik" were settled
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627

amicably by irrigation specialists (aquawam, pl. iquawamen). In the latter instance, these specialists estimated the amount of damage done, and the individual who caused it had to pay for it.[120] The only penalty, most of the time, was indemnity of such damage, through, above all, small reparation projects. In case a man was also punished by fining, the fines were converted into improvements in the irrigation ditches. The irrigators did not make up special communities with their own jurisdiction or functionaries dedicated to the inspection and fulfillment of the agreements, because this rudimentary society was not fond of bureaucrats(!).....

The difficulty with these irrigation agreements rested primarily, more than on the distribution of the flow of water, on rather the outline of the ditch, for which it was necessary to acquire previously the consent of each one of the property owners on whose plots of land it ran over; these individuals did not ordinarily give in unless they themselves were given an irrigation turn; and, in addition, they made it clear that the ditch was not to cross their land but to follow the boundaries around it.

Irrigation turns, in the instances dealt with here, are simple, and correspond to the same notion which will later be discussed for the bigger water-courses, and which is based upon the principle of equitable distribution, with the utilization of natural means to calculate the time. This is reduced, once the number of turns is known, to fixing the duration of these and the order in which they occur. This customarily takes place at the point of origin of the ditch or dam; once assembled, the irrigators draw lots, by which each one of them puts down a straw while another, with his back turned,

423 675 312 that this would have rendered useless all demands and threats voiced by downstream groupings for the transfer of even a minimal amount of flow, and in our time things have not varied; those upstream use all the water that they can, and those downstream, the overflow; and it would not occur to anybody to vary this procedure, followed since time 312 immemorial. To this procedure is very well adapted the regimen of the rivers in the Rif, in the dry beds of which water does not run on the surface, but rises up only in fixed points, each one of these forming, with the help of improvised dams, the sources or points of origin of successive irrigation ditches, making them seemingly independent.

133 241 [578] In addition, the narrow fissures which form the beds of such torrential rivers, their irregular flow, their devastating overflows and floods, in short, opposed nature and men so that the latter would have some motive for doing this and even need it for their small irrigable crop and the bare necessities of life; for it did not and would not occur to anyone to work or cultivate any more land than that necessary for his own subsistence, as anything else, overflow aside, would have attracted the envy of neighbors and strangers, and this in 675 turn would have led to blows. An association on such a large scale and for such modest objectives was, for this reason, impossible, inefficacious and unnecessary.

312 The river waters, in their upper courses, running between steep banks, scarcely need to be utilized even to a small degree on the minute riverain plots of land. In those beds, water, although actually slight in amount, is in fact overabundant, and land is lacking. Limited to the confines of the ditch by the topographical conditions

312 lead the water to which he has a right in any of the main ditches into
591 these three smaller ones. The ditch of Tuth, when it has water, moves
613 the mill of Dharwa nd-Hajj Mis'aud. The irrigators of the Tafadhna
[402] ditch, whether the turn is interrupted or not, have the right to use that of Shimurra, but giving first choice to those who use it regularly.

16. QANUN OF THE NKUR RIVER (AITH WARYAGHAR):

312 The Nkur River has an irrigation regimen which is less exact than
675 that of the Ghis, and the written agreements on the distribution of its waters are few and recent. One of them refers to the division of waters between the Axt Tuzin and the Aith Bu 'Ayyash, with the intervention of the Bureau of the Aith Waryaghar (in Ajdir).[146] In any case, the establishment of such agreements is based upon the same notions and the same norms as in those pertaining to the Ghis.A

312 In the Middle and Upper Nkur, there is more than enough water to
[621] irrigate the meanders which the river has created, through which it is easy to affix by-laws to the 'azibs[147] of the neighboring jma'ths which own land on its banks, given the small amount of land under irrigation.
[241] There is even freedom and waste, and it is not uncommon to see, during harvest time, the formation of tiny threshing floors with capricious irrigation-furrows of 300 and 500 meters in the middle of the river bed.

[619] There are meanders like Dhaghzwith n Dasa (upstream, in the territory of Axt Tuzin, and near the bridge on the right bank) and Dhazur-akhth (downstream, in the territory of the Aith Bu 'Ayyash, and also right beside the same bridge, but on the left bank), which are of relatively large dimension and which have already stabilized turns; but the real difficulties and concomitant near-perfect solutions are

A, [See pp. 361-369--Analyst]

5: Blanco Izaga G-4,5 (1914-1945) 1975 MX3 Rif MX3
Aith Waryaghar

000 In my humble opinion there is more than enough water for the surface area which can be irrigated; and so much more, in fact, that the amount which is lost is greater than that which is put to use.

312 (494) Calculating grosso modo an irrigable area of 5000 hectars, bounded by the main road on the west, as well as a subalveal flow of over 1 cubic meter per second from the Nkur River, according to the approximate calculations made when the supports of the new bridge (i.e. crossing the river at Km. 20 to the Axt Tuzin and Melilla) were set up, it would not be far off the mark to estimate the flow in both rivers, plus that of Thifarwin (in the Aith Bu 'Ayyash) at some 3 cubic meters per second, or 10,000 cubic meters per hour; and this would give daily 48 cubic meters per hectar under permanent irrigation.

Most of this water is now lost in the sea....and represents several millions of pesetas lost while technicians, policy makers and businessmen show no iterest.

(571) (435) (241) It should be remembered that a single turn of irrigation water every eight days costs 500 to 600 duros in the Plain of al-Husaima, and continually produces two harvests a year.

Ghis:

Ditch of Bufna'iz -- May 20, 1938 -- carried 131 liters per second

Ditch of r-Bzimma -- May 20, 1938 -- carried 46 liters per second

Nkur:

Ditch of Aghzar Amzyan -- May 20, 1938 -- carried 770 liters per second

Ditch of Thimsaman -- May 20, 1938 -- carried 770 liters per second

Ditch of Sidd Jdid -- May 20, 1938 -- carried about 40 liters per second

Ditch of 'Ain Harri -- May 20, 1938 -- carried about 40 liters per second

Ditch of Swani -- May 20, 1938 -- carried about 40 liters per second

243 While barley is the predominant crop, maize is an important secondary one. Wheat and rye are also grown but the latter is held in low esteem as a food product[1] and the former does not grow successfully on the thin residual soil of the region. In
241 [312] those areas where there are rivers or streams, small gardens are maintained by irrigation canals. In these are cultivated potatoes, tomatoes, onions, garlic, squash, turnips, green peppers and mint.

245 In addition to the grains, maize, and small vegetable gardens, many households also have orchards of fruit and nut trees. Fig, lemon, orange, pomegranate, walnut, almond, and olive trees are common. In some areas grapes are also cultivated. Around each house is a grove of prickly pears which serves not only as a means of preserving privacy, but also as a source of food. These products not only supplement and add variety to the regular diet but in the case of oranges, almonds
[258] and grapes serve as cash crops. The olives are pressed by the
[262] women to provide crude cooking oil. Nuts, dried grapes and figs
[221] are an important winter food reserve. The work of pruning and grafting goes on during the months of February-March-April.

243 In early summer harvesting begins. Both men and women engage in this activity, the men doing the reaping with hand

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[829] [1]Coon (1931:47-48) states that rye is highly praised by the Riffian but that since the Arabs scorn it as a foodstuff the Berbers are ashamed to admit its worth.

243 sickles and the women carrying the grain stalks to the threshing areas. The threshing floors are generally merely a circle of dirt ground, although in some areas they are paved. The stalks [231] are placed on this circular floor and mules, donkeys, or cattle are driven about inside the circle, trampling the grain and separating it from the chaff. The grain is further refined by hand-winnowing done by the women. The straw is accumulated in circu- [231] lar stacks to be preserved as food for the animals during the winter months. When relatives have worked a common piece of land 243 465 the yield is divided by measuring off the appropriate amount of grain in straw baskets. If the division is on a one-for-one basis, each alternate basket will go to one of the parties. If the division is at some other ratio, the number of baskets will accordingly be at that ratio. If the land was ploughed, planted [427] and harvested by a akhammas, a sharecropping laborer, the owner of the land will receive four bushels out of every five, the remaining fifth going to the akhammas.

241 Throughout the summer the vegetables, fruits and nuts are harvested as they come ripe. In late summer and early autumn the [465] maize and grapes are harvested. Once again, if the labor of several families or of akhammas has been involved, straw baskets are used to allot out to each man his appropriate portion. It is 585 221 during this period, in the months of August and September, that [241] weddings are held. The agricultural cycle has been completed and there is spare time to arrange the necessary items for a wedding. Also this is the period in which the optimum amount of food is

585 available and the weather is most propitious for holding the
221 giant outside wedding ceremonies common in the Central Rif.

221 After the wedding season, the cycle resumes and with the
241 first autumn rains the land is ploughed anew for the next crop.
[461] This process begins for most men when they are but 12 or 13, and continues with monotonous regularity until they die or become too
[777] enfeebled to do the work. Perhaps it is this unending sameness which contributes to some of the fatalistic beliefs held by the tribesmen.

231 Although the Berber of the Central Rif mountains is primarily an agriculturalist, he also maintains a stock of assorted animals. Most families have a herd of goats, a few sheep, and some chickens. If the household has some wealth they will also have a cow and either a mule or donkey. Although livestock is
[262] not the primary food source, it is a very important secondary supply, providing milk, butter, eggs, and meat. Livestock is
[556] also an important source of material and social wealth and of
[591] prestige. Animals serve as reserve capital on the hoof which
[471] can be converted into hard cash at the weekly market. Perhaps
231 most important is the ritual value of animals. While grain is
796 vital for subsistence there is very little social significance attached to it. On the other hand, while animals are secondary to subsistence they are the essence of the ceremonial and ritual life of the Riffian. There are practically no communal events,

346 794 The religious function of the mosque is by no means its most important. It also serves as the location for the Koranic school which as recently as ten years ago was the only sort of education provided for the children of the fellah. In areas where population density is high, the government has set up secular schools [658] [178] which all but replace the Koranic education. The mosque is also used as the place for public assembly of the community.

The mosque is built and kept in repair by the men of the community either through their own labor or through subscription to hire a professional master builder. The property belongs to 346 794 the mosque, generally from specific inheritance provisions. Many 423 larger property owners wishing to pave their way to paradise by [425] some act on earth will donate property to religious organizations. [782] Crops are grown on this bequested territory which serve to meet [241] some of the expenses of the religious man in charge of the mosque.

793 The mosque is presided over by a fqih, a learned man who [212] has had Koranic education and knows how to read and write Arabic. [794] He delivers the weekly sermon and provides lessons to the youth in Koranic education. It is the obligation of every married man 793 794 within the area served by the mosque to make an annual donation 465 to the mosque to provide for the fqih. The amount, while generally the same for all family heads, is not permanently fixed and can be adjusted according to how good or bad the crop yield was from the preceding year. In the year I was present the community assembly assessed a total of 25 kilos of barley to each man. The fqih also receives weekly donations of eggs from his

751 vary greatly, from less than a dirham to several hundred dirhams.
435 Although it is impossible to estimate how much money goes for investments of this sort, the qualitative importance of investments to prevent misfortune from the evil eye is great.

796 One other rite ought to be mentioned of imitative magic
241 directly related to production. Since crops are dry farmed,
789 the success of any one year depends on the amount of rain
821 received in that year. Unfortunately, the Rif is not blessed with a stable rainfall. When there is drought or even the fear of impending drought, each community in the Central Rif has a Bride-of-the-Rain ceremony (thasrith anzar). For such a ceremony a ladle normally used to put bread into the household ovens is dressed in the costume of a bride. The young female virgins
[533] carry this 'bride' from house to house within their community,
[539] singing the refrain,

s-reeth-nis-la
arabe ya-sidi
stawah- n-shala

Give us Oh God
Give us water quickly
Make water quickly.

They stop at each household to receive coins and prepared food.
[782] At the same time, all the men go to the communal mosque or a nearby saint's tomb where they sacrifice a bull purchased with contributions for everyone in the community. After the ceremony the meat is distributed among the participants. Although this example is related to both consumption and production, it would

seem that no technical analysis of it based on markets, price mechanisms or entrepreneur skill will offer satisfactory results.

The strands of the argument in this chapter may now be brought together. One of the forces that is influential in determining how wealth shall be used is located in the world of the supernatural. Motivated by mysticism, by religious duty and by fear, the Berber of the Rif seeks succor in a wide variety of activities. All such activities require outlays of wealth which are, on the whole, economically nonproductive (in that one does not have a chance of economic reward from one's investment) but are socially satisfying and beneficial. Such moral and magical imperatives create an incentive towards investment, which is relatively unimportant in industrial society.

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presence of an influential family of *shurfa*, alleged descendants of the Prophet, who encouraged a shift from Berber to Arabic speech. Rifian is spoken in the hamlet of the Aith Azza, but the weekly market of Targist has functioned traditionally as a trading center for the Sanhajan tribes, especially Zarqat. The Aith Mazduwi also appear to be of mixed origin, for both the Sanhajan and Rifian dialects are spoken by this tribe.

Sanhajans and Ghmarans generally regard all tribes to the east of them as Rifian, but among the Aith Bu Yihyi and other tribes of the Kert and Moulouya valleys this appellation is restricted to the tribes of the basin of Wad Nkour. It is useful to think of a zone of transition between the "true Rif"—Aith Wariyaghar, Ibuqquyen, Aith Ammarth, Igzinnayen, Aith Tuzin, Thimsaman—and the eastern frontier of the northern zone. The Ulad Stut are intrusive bedawin, like the Khlut of the Atlantic littoral. The remaining tribes may be described as "eastern Rifians." Two minor confederations are recognized within this group. The first, "Iqar'ayen" in Rifian and "Gal'aya" in Arabic, includes five tribes: Aith Bu Ifrur, Aith Sidar, Imazujen, Aith Bu Gafar, and Aith Shikar. The second, called "Garet" or "Gart" in Arabic, is formed of Ibdharsen and Aith Bu Yihyi. The dialect of the Aith Iznasen is intelligible to most Rifians, but there seems to be general agreement that the Rif, even in a broad sense, does not extend beyond Wad Moulouya.

Land and Livelihood

In the total context of geography, northern Morocco should be described as an isolated and generally inhospitable area. Moving from the Atlantic coast toward the east, the traveler is confronted with an abrupt transition from alluvial plains and terraces to a wild and chaotic zone of steep slopes and narrow ridges. The eastern lowlands are more favorable from a physiographic point of view, but the Rif chain creates a rain shadow, and the tribesmen of the eastern Rif, Garet, and Gal'aya suffer from meager and erratic rainfall. Cut off to the south by the Rif chain and to the north by inhospitable coasts, northern Morocco cannot compare with Greece, Italy, southern France, or Andalusia as a breeding place for advanced civilization. It is a rampart and a place of refuge.

The tribesmen of northern Morocco share an agricultural heritage derived in part from contacts with Phoenicians, Romans, Arabs, and Europeans. Farming methods are primitive, for the mountain tribes learned centuries ago how to grow the maximum amount of food on tiny terraces, and the size of their fields and the steepness of slopes discourage mechanization. Barley and wheat constitute the most important crops. Wherever water is available for irrigation, the cereals, which are dry-farmed, are supplemented by summer crops of maize, legumes, and vegetables. Horticulture provides precious additional food, and during the spring, when cereal stocks are low, raisins, figs, and nuts are staples. In the semiarid lowlands east of the Rif chain, only cereal farming is possible, and famine may be experienced when rains are meager or arrive too late. The great seasonal migration from this area toward the French farms of eastern Algeria resulted from an imbalance between population and food supply.

Variations in crop combinations and diet are partly conditioned by environmental factors, and hence will be considered in greater detail in chapter ii. A

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few notes here will suffice to illustrate the range of difference. The Sanhajans are masters of terracing and irrigation, but in horticultural skill they yield to the Rifians, who are noted also for honey and grapes. The Ulad Stut, thanks to their bedawin origin, are expert in the preparation of milk products. The Ghmarans are northern Morocco's best fishermen, but their skill is limited to the use of skiffs and seines. The Sanhajans are most interested in freshwater fishing, and they may also be the best hunters in the northern zone. These points will be elaborated in chapter vi.

Cultural Uniformity and Diversity

In order to place northern Morocco in proper perspective, we must consider two classes of culture traits: those that are ubiquitous and those that are limited to certain parts of this zone. For example, the Rifian is in many respects quite different from the Ghmaran or Jbalan. He speaks a different language, has different ideas of honor and shame, wears his turban differently, and builds a different type of house. Yet as Moroccans the Rifians, Ghmarans, and Jbalans share ideas and objects that are rare or unknown in other parts of the Muslim world.

All Moroccans, at least in theory, are good Muslims. Islam does not confine itself to ideas and their influence on the spirit of man: it is a religion of force and authority, a system of law, and a basis of government. The influence of Islam is evident in institutions and patterns of behavior that affect the form and function of every village and farmstead. To say that Moroccans are Muslims is to assert that they share ideas and institutions common to the entire Muslim world. Yet it is also true that Islam in Morocco has many unusual features. It is a common saying that Berber culture constitutes the foundation of the Moroccan house, while Arab customs and religion are only the whitewash on the walls.[3]

A distinguishing feature of Moroccan Islam is the elaborate development of brotherhoods and the cult of saints. These heterodox developments seem in part to reflect pre-Islamic beliefs. The Berber tribesman, though he may be ignorant of Arabic, yields to no one in the belief that he is pious and correct. He prays, keeps the fast of Ramadan, and honors those of his tribe who have made the pilgrimage to Mecca. In this sense he is like all Muslims, but, as Hart aptly remarks, he retains local saints to comfort him and local jinns to plague and torment him.[4] One aspect of these beliefs is the superstition that relates to the sanctity of cemeteries and shrines. In chapter vii it will be shown that there is often a marked contrast between the plant cover of sacred land and that of profane land.

Berber kinship terminology, like that of the Arabs, is a bifurcate collateral type.[5] The terms for mother's brother and for father's brother are different, as are the terms for mother's sister and for father's sister. The inheritance of property follows the standard Maliki practice, which allots a share to each son equal to that falling to two daughters. Descent is patrilineal, and the number of pa-

[3] D. M. Hart, "Morocco's Saints and Jinns," *Tomorrow*, 7 (1959), 45–54.
[4] *Ibid*, p. 46.
[5] D. M. Hart, *Morocco: Subcontractor's Monograph* (New Haven: Human Relations Area Files, 1956), pp. 136a–140.

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611 Descent is patrilineal, and the number of paternal relatives a Moroccan can remember is always greater than the number on the mother's side.[1]

565 184 The important details of social stratification show little variation within the northern zone. Real or alleged descendants of the Prophet constitute the highest class. Among tribesmen, the most respected and important class is composed of gentlemen farmers. At the bottom of the scale are blacksmiths, market weighers and criers, musicians and dancers, and tinkers or other itinerant artisans. The Jews, regardless of their profession, are lowest in the scale.

621 184 Besides these aspects of religion and social organization, there are many features of settlement and livelihood that show little variation within the northern zone. The basic unit of settlement is the hamlet or farmstead. Settlements of more than a few hundred inhabitants are rare. For every farmer who grows 241 433 cash crops there are at least a hundred others who are concerned only with their own or community needs. In all Morocco, subsistence farming and barter govern [439] rural economy, and trading takes place at weekly markets held in the open air. [443] One of the clearest expressions of cultural diversity is the division of northern Morocco into zones of Arabic and Berber speech, a division which coincides with other cultural frontiers. Generally speaking, the eastern half of the area (Rif, Garet, Gal'aya) retains Berber speech, whereas the western half (Jbala, Ghmara) has been Arabized. The historical and cultural factors that have brought about this division will be considered in chapter iii.

175 631 648 A state, by minimum definition, is an extent of inhabited territory presided over by a government capable of asserting its authority. During most of its history, Morocco was hardly a state in this sense of the word. One of the important themes of Moroccan history is the division of the country into lands of government (*bilad al-makhzen*) and lands of dissidence (*bilad as-siba*). The belligerence of the free tribes was based not only on their hatred of taxes[1] and authoritarian order but also on their inability to conceive of any social or political unit larger than the tribe or confederation of tribes. Most of the Rif was part of the land of dissidence.[2] Jbala and Ghmara formed an intermediate zone, neither submissive nor openly rebellious in the face of domination from without. The plains of Wad Lukkus and the Gharb were easier to subdue.

619 628 [648] Dissidence was expressed in intertribal and intratribal conflict as well as in opposition to the central government. In most of the Rif, and especially in Aith Wariyaghar, quarrels over ownership of land, water rights, and personal affronts led to blood feuds of extraordinary savagery. Some feuds did not end until one [571] of the participating families was exterminated. Feuding and the necessity for [616] defense gave rise to a complex system of alliances based in part upon moieties. [712] In the days before the Spanish occupation, each house in Aith Wariyaghar had

[1] In popular writings Berber society is sometimes described as being influenced by matriarchy. This assumption is based upon the fact that Berber women are much more active and unabashed [113] than the Arabized women of the towns; it is based also upon the tradition that the Garmantians were led by a queen or prophetess. E.-F. Gautier, "The Monument of Tin Hanan in the Ahaggar," *Geog. Rev.*, 24 (1934), 439–443.

[2] *Makhzen* comes from the verb *khazana*, "to lock up" or "to hoard." The word is synonymous [113] with "government" and more especially with the treasury department. E. Michaux-Bellaire, "Makhzen," *Encyclopedia of Islam* (Leiden: E. J. Brill, 1913–1938).

[3] Nevill Barbour, ed., *A Survey of North West Africa (the Maghrib)* (London and New York: [113] Oxford University Press, 1959), pp. 380–381.

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Palmetto is exploited for its edible bud, and the old women who sell *ghaz* (palm cabbage) are a common sight in the streets of Tetuán and Tangier. During the summer, when cereal stocks are low, many families spend some time digging up palmetto.

Palmetto is exploited also for its fiber, used in the manufacture of *crin végétal*. The collecting is done by women, who deposit bundles of palm blades near scales set out along most of the roads. The fiber is dried in the sun, and then twisted into loose rope and baled for marketing. The finished product serves as a substitute for horsehair in upholstering. In 1955, exporters in the northern zone handled 12,622 tons of fiber.[20] Native craftsmen make hats, mats, and baskets of the same material.

Disturbance of this sort encourages lateral development rather than tall growth from a single stock, but seldom results in destruction of the plant.[21] The resiliency of palmetto is attested by its persistence in cultivated fields. The native farmer has no means of eradicating the deep roots of this plant. Fields are burned and then cleared with hoes and cutting tools. This practice eliminates most shrubs, but it does not destroy palmetto. On the contrary, this plant, as a deep-rooting and heliophilous species, profits from the removal of competitive growth. When fields lie fallow or are abandoned, dwarf palm promptly begins to colonize.[22] In relatively undisturbed formations the palmetto is of secondary importance. It is not conspicuous, for example, in mature stands of cork oak. On sacred sites palmetto is usually found on the edges of the protected growth. Where shrub vegetation is especially dense, as it is along the Mediterranean coast from Wad Lao to Puerto Capaz, dwarf palm grows on sunny south-facing slopes and on the upper edges of stream channels. Pure stands of palmetto seem to indicate floristic and morphologic impoverishment, a reduction of vegetation to its most resistant element.

Pistacia lentiscus (Arabic *dro*) is the second most important element of palmetto scrub. As with dwarf palm, it may be doubted that this plant should be described as a shrub. *Dro* usually appears as a shrub about one meter high, but where soils are deep and plants protected, it may grow three to five meters high. Such trees are rare today. With the exception of a few specimens scattered in the Anjra hills northeast of Tetuán, I have seen tall pistacias only on sacred sites and in a few areas protected by fences. In one form or the other this plant is encountered as an element of maqui in most of the Mediterranean region. It is found almost everywhere in Morocco; only in areas of extreme aridity and in the mountains above 1,500 meters is it absent. *Dro* is mixed with *Zizyphus lotus* in the Nkour

[20] *Marruecos, zona jalifana: guía económica* (Tetuán: Delegación de Economía, 1955), p. 59.

[21] The ability of the palmetto to survive disturbance is recognized by Theophrastus (*Enquiry into Plants* . . . , II, 6): "The dwarf-palm is a distinct kind, having nothing but its name in common with the other palms. For if its head is removed, it survives, and, if it is cut down, it shoots again from the roots." Louis Emberger concludes, in *Les Arbres du Maroc et comment les reconnaître* (Paris: Larose, 1938), p. 76: "Cette forme naine est déterminée par l'action continuelle des troupeaux, qui broutent les jeunes pousses, et de l'homme qui exploite le Palmier nain pour en faire des cordages et consummer le cœur." M. Rikli, "Marokko," *Vegetationsbilder*, 24, Heft 4/5 (1934), concurs in this judgment, and adds that the prevalent form of the palmetto "als fuss- bis kniehohes Hartlaubgest . . . ist sekundär, durch anthro- und zoogene Einwirkung entstanden."

[22] According to Louis Emberger, *Aperçu général sur la végétation du Maroc* (Bern: Hans Huber, 1939), p. 150, "son expansion est le résultat de la destruction des forêts dans lesquelles il était un élément floristique constant." G. Kuhnholtz-Lordat, *La Terre incendiée: essai d'agronomie comparée* (Nimes: Editions de la Maison Carrée, 1939), p. 44, coins a new verb, *endoumer*, the process by which forests degenerate to thickets of *doum*.

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sive pilgrimages to the tombs of both Mulai Idris and Mulai Abd al-Salam are equal to one to Mecca.[11] The fast of Ramadan is strictly observed even in the remote highlands, but many Berbers are extremely casual about prayer, and the idea of almsgiving, in the sense of an income or head tax, was never accepted by free tribes. On the other hand, most tribes promptly accepted the Qur'anic distinction between what is *halal* (clean, or permitted) and *haram* (unclean, or forbidden). Thus carnivorous animals and birds of prey were excluded as food, and also eels and mackerel, since they were supposed to be unclean feeders. Consumption of wine ceased, although vineyards are still numerous and raisins are an important food. A generation ago the Berbers probably hunted the wild boar and may even have kept domestic pigs, but there is evidence that the latter practice continues.[12]

There is nothing blind or unreasonable about Berber conservatism. Once the value of an innovation has been established, it is accepted without reservation. Berber agriculture today is a blend of crops and methods derived from diverse contacts during millennia. Some of the contributions of the Arabs are easy to discern; others are not. The Romans and Phoenicians both contributed to North African skill in irrigation, but the Arabs added refinements in technique.[13] It is not known whether the Arabs or the Romans introduced the Persian system of underground infiltration tunnels (*foggara*), but the Arabs seem to have brought this system to Spain.[14] It cannot be asserted that the Arabs introduced the date palm, for there is reason to believe that palms were cultivated in the Fezzan in classical time.[15] The Latin name for the pomegranate, *Malum punicum* (apple of Carthage), suggests that it was cultivated in northern Africa long before the Arabs arrived. Barley and wheat, the basic cereals, were cultivated before the arrival of the Phoenicians. The Arabs may have been responsible for the introduction of hard wheat (*Triticum durum*), which is still used for semolina. *Triticum dicoccum* has been found in the Roman ruins of Timgad and Djemila.[16] The ubiquitous wheat at present is *T. aestivum*. The initial dispersal of rye seems to have been as a weed in wheat fields, and it was probably carried to northern Africa by the Phoenicians or the Romans. Sorghum was cultivated in eastern and west-central Africa in Neolithic time. The races of sorghum now cultivated in Morocco (*Sorghum vulgare ssp. dura* and *ssp. cernuum*) presumably originated in Egypt or the Upper Nile; it is not known when they arrived in Barbary. The introduction of barley may have taken place in prehistoric time, perhaps when the Berbers themselves arrived. The Arabs may have been responsible for new dispersals of the dromedary (which had been brought to Tunisia by the Romans), but the other domestic animals were known throughout northern Africa in Neolithic time.

Thus the basic elements of north African agriculture were already present

[11] D. M. Hart, "An Imarah in the Central Rif: The Annual Pilgrimage to Sidi Bu Khiyar," *Tamuda*, 4 (1957), 239–245.

[12] Coon, "Tribes of the Rif," p. 41, cited in note 4.

[13] The Spanish word for "irrigation ditch," *acequia*, shows little change from the Arabic *al-saqiyah*.

[14] G. B. Cressey, "Qanats, Karez, and Foggaras," *Geog. Rev.*, 48 (1958), 27–44.

[15] Herodotus, *History*, IV, 183. See also Aug. Chevalier, "Les productions végétales du Sahara," *Revue de Botanique Appliquée et d'Agriculture Tropicale*, 12 (1932), 711 ff.

[16] André Haudricourt and Louis Hedin, *L'Homme et les plantes cultivées* (4th ed., Paris: Gallimard, 1943), p. 115.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3

when the Arabs arrived. But the Arabs introduced a number of additional crops: rice (Sp. *arroz;* Ar. *al-aruzz*), the apricot (Sp. *albaricoque;* Ar. *al-barquq*), and cotton (Old Sp. *coton;* Ar. *al-qutn*).[71] The Arabs brought the bitter or Seville orange, but the sweet or common orange was introduced by the Portuguese from India.[72] The Arabs also brought the artichoke (from the eastern Mediterranean), spinach (from Persia), sugar cane (probably from India), the mulberry (originally from China), pepper, ginger, saffron, and parsley. Hemp (*Cannabis sativa*), the great cash crop of the Sanhajan highlands and the object of a lively contraband trade between Spanish and French Morocco, may also have been carried to Barbary by the Arabs. In an indirect sense the Arabs may be credited with the introduction of a number of New World plants, for many of the Spanish Muslims did not leave al-Andalus until after the final order of expulsion in 1609. By that time Europeans were familiar with the agave, opuntia, tomato, and the great American crop combination of maize, beans, and squash.

Moroccan Jews

Of the Hebrew people in Morocco, the largest and most prosperous group are the Sephardic Jews who were driven out of Spain after the reconquest of Andalusia. A second, quite different group was already settled in the country when their co-religionists arrived.

The Arab chroniclers state that Jews were in Morocco at the time of the first Muslim invasion. They may have arrived with the Phoenicians or the Romans, for Hebrew scholars believe that some of their religious practices are pre-Talmudic.[73] Today most of the original Jews inhabit ghettos (*mellah*)[74] in the cities, but a few are scattered among the rural tribes. The latter usually pay tribute to the tribesmen with whom they live. Many are caravan men who travel with mule and donkey trains into the less accessible parts of the country. Others are tinkers and petty traders, while many of the prosperous urban Jews are moneylenders, jewelers, and tailors. A small but interesting group cultivates small plots in the High Atlas, and speaks Berber domestically. These "Berber" Jews, like the peasant Jews of Yemen, the Jewish highlanders of the Caucasus, the Falasha of Ethiopia, and the Turkish-speaking Jews of the Crimea, present a difficult problem for historical research.[75] They may be descendants of ancient immigrants, but it seems more likely that they are descendants of indigenous peoples who were converted to Judaism at some remote time.

When the Sephardim arrived in Morocco they negotiated an ordinance as to their status, which also contained rules laid down for the guidance of their own conduct, no doubt out of fear that contact with the more primitive Moroccan Jews might compromise their tenets. The Sephardim had already abandoned

[71] Names from P. K. Hitti, *History of the Arabs* (New York: The Macmillan Co., 1951), p. 528.

[72] "Orange" comes from the Spanish *naranja* through the Arabic *naranj* and the Persian *narang*. "Lemon" is the Arabic *laymun* and the Persian *limun*. *Ibid.*, p. 351.

[73] For clarification of this point, see Hahum Slouschz, *Hebraeo-phéniciens et Judeo-berbères* (Paris: Leroux, 1908); and André Chouraqui, *Les Juifs d'Afrique du Nord* (Paris: Presses Universitaires de France, 1952).

[74] *Mellah* is the Arabic word for "salt." The usual explanation for this association is that Jews were once assigned the task of preserving the heads of the sultan's enemies so that they could be put on display.

[75] A. J. Toynbee, *A Study of History* (London: Oxford University Press, 1934), II, 257, 402–412.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Jebala MX2

The Agricultural Calendar

Moroccan agriculture is conducted on the basis of the Julian almanac, and the Latin names for the months have passed with but slight changes into Arabic and Berber. In most of northern Morocco the agricultural cycle involves a combination of dry farming, horticulture, and the cultivation of small irrigated plots. Dry farming as practiced in the Mediterranean region is essentially a matter of farming the same land every other year and of tilling it during the fallow period. In this way as much moisture as possible is kept in the ground for the next year. Since few communities can produce enough grain during the alternate seasons to allow for the fallow years, dry farming requires constant clearing of new land.

In the hilly areas of Jbala and Ghmara the beginning of the agricultural year is marked by fires set to clear new fields, and the haze of smoke lingers until the arrival of the first rains. By the end of the summer drought, animals are weakened by the scarcity of feed; and wherever the soil is clayey the drought-hardened surface is difficult to plow. So the farmer waits for the first rains for plowing and the second for seeding. After the soil has been turned, cereals, usually barley or hard wheat, are broadcast. Then the soil is again worked with the plow and, since Moroccans do not use the harrow, clods are broken with clubs or hoes.

In the western half of the northern zone, plowing usually begins toward the end of September, and sowing is completed by the beginning of November. In the eastern sector the first heavy rains may not come until March or April. In this event, no further thought is given to barley or wheat, and a desperate effort is made to prepare the soil for a summer crop of sorghum. When cereals are sown, the feverish activity of autumn gives way to a period of virtual hibernation. Only the women keep busy, for there is always need for fodder and fuel.

In frost-free areas, February marks the beginning of the work of planting, pruning, grafting, and fertilizing the fruit and nut trees. This task continues through March and April. In the lower areas of the Rif the most common trees are the fig, pomegranate, almond, and olive. In the highlands walnuts are most important. Trees are cared for assiduously, for dried figs, raisins, and nuts constitute the principal food reserves after the cereals have been consumed. Since they do not have to be watered, figs and vines usually occupy the higher and steeper slopes. New olive trees are usually obtained by grafting on the oleaster. The olives are often left so long in heaps on the ground that they begin to ferment, and the oil is very rancid when the fruit is eventually pressed.

The arduous task of rebuilding terraces, dams, and ditches begins in March. This work is not yet finished when it is time to begin the harvest of the cereals. The shortage of manpower at this time is offset by the women, who reap the grain with sickles and carry it to threshing floors. There it remains until the men have completed the planting of the summer crops. Then all effort is devoted to threshing and winnowing. This work begins in July and in bountiful years it may still be in progress when the first rains fall. Threshing takes place on communal floors, which may or may not be paved. These are always in an exposed position, and when the mixture of grain and straw is thrown in the air, it is separated

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Senhaja MX4

by the wind. Cattle, mules, or donkeys tread the crop and separate the grain from the chaff. As the animals are driven in a circle, the men work with winnowing forks (pl. 5, *a*). After most of the chaff has been removed, the women take over and finish the winnowing by hand. The men then set to work piling up the straw to be used as fodder during the winter months. In Garet and Gal'aya, the usual form of strawstacks is oblong; in the Rif they have a circular form. Strawstacks are sometimes covered with a thin veneer of mud; sometimes they are held in shape by stones tied to ropes. In the wetter, western provinces straw must be stored inside.

In early September, maize is harvested and the almonds and figs are collected. The remaining trees, including the olive, do not bear fruit until November or December. Grape picking, usually in mid-September, marks the end of the agricultural year. After this has been done, the cereals reaped and threshed, and the strawstacks prepared, there is time for rejoicing. September is the usual month for weddings and also for festivals and pilgrimages. But it is already time to think of the new cereal crop, and smoke from fresh clearings marks the beginning of a new year.

The cycle just described is most applicable to Ghmara, Sanhaja as-Srair, and the western margins of the Rif. On the Atlantic littoral there is little danger of frost, and vegetables may be grown at any time of the year. The calendar of events in the drier and warmer parts of the northern zone is usually two or three weeks ahead of the cycle in the highlands. When autumn rains fall over the zone, cereals are ready for harvest in the warmer eastern sector in May, but as often as not the advantage of higher temperatures is offset by meager or tardy precipitation. In 1957 the first heavy rains did not reach Gal'aya until April.

The pattern of land use in the highlands reflects centuries of trial and error. The problem here is that it is virtually impossible to grow more than one crop on the same plot of land. Maize and hemp must be planted before the cereals are ripe, and there is also a conflict of time between the harvest of cereals and the planting of vegetables. Hence a division is made between land planted to summer and to winter crops. Since the former are dry-farmed and the latter irrigated, this division coincides with a break in slope. When there is abundant water for irrigation, cereals, figs, and vines are pushed to higher and more precipitous slopes. The Aith Arbi, who own valuable terraced land on the north slope of Adrar Tidighin (pl. 6), arranged a generation ago to purchase additional land at a lower elevation so that it would no longer be necessary to devote precious irrigable land to cereals. Similar divisions have been effected by many highland communities. The disadvantages of specialization are offset also by barter at the weekly markets. In Ktama, tribesmen from the deep valley of Abd al-Ghaya grow an abundance of grapes, figs, oranges, and vegetables, which can be exchanged for grain produced on higher and drier land.

Most highland communities are not so fortunate, and an attempt is made to allocate land for each season. Cultivation is usually spread over three distinct zones, which are worked at different times of the year. First, and lowest in a valley, is the zone of terraces reserved for the irrigated crops. The next zone, at a slightly higher elevation, is planted to cereals, figs, and vines. A still higher

[See pp. 129-130--Analyst]

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zone may be used only for pasture. This arrangement seems orderly and rational, but its effect is to accelerate the deterioration of the land. Grain stubble (which is often grazed) and vines (which are often placed parallel to the slope) do not constitute an adequate protection for the soil. As population increases, the zones of dry farming and pasture are extended to higher slopes. First the forest is destroyed, then the scrub cover is removed, and eventually the zone of dry farming is stripped of soil.[1]

Crop Combinations

The basic crops of northern Morocco are well adapted to the Mediterranean climate, for cereals can be grown during the rainy season, and trees, by virtue of their large root systems, are suited to the long dry summers. When water is available for irrigation, diets are balanced and there is no danger of famine. This happy combination of dry farming, horticulture, and gardening is realized only in the highlands and on the main river plains. Irrigated land probably accounts for less than 5 per cent of the surface of the northern zone. Most tribesmen depend on the unpredictable rains.

TABLE 4
Land under Cereals
(Hectares)

	1938-40	1951	1953	1955
Barley	75,729	193,600	164,129	174,905
Wheat	30,518	70,895	73,180	76,392
Sorghum	25,656	49,092	51,094	46,981
Maize	4,318	4,992	6,020	6,206
Rye	1,253	3,411	3,724	3,305
Totals	137,474	321,991	298,147	307,789

Source: *Anuario estadístico, 1953-53* (Madrid, 1955), p. 93.

In the whole of Morocco about 90 per cent of the land under field crops is planted to cereals. Table 4 shows the amount of land used for growing cereals in the northern zone. Barley accounts for nearly half of the total cultivated area in the northern zone.[2] One advantage of barley is that it can be cut while green, thus making space for summer crops. When barley is cut green, it is toasted before it is milled, and then is mixed with butter to form a paste. Wheat is more highly prized, but is less successful on thin residual soils. In many areas wheat flour is used only as a flavoring and leavening agent. Rye is grown in the Sanhajan highlands, but is not generally regarded as an important food. No one would think of serving rye bread to a guest. At the approach of a visitor, an attempt may even be made to hide all rye bread. When land is abundant, rye may be grown for use as thatch, and the grain is not collected. In the Rif it used to be a

[1] On the relationship of economic history and erosion, see Paul Vageler, "Zur Bodengeographie Algiers: Faktoren der Bodenbildung und -verteilung. Die Catena als bodengenetische Einheit," *Petermanns Mitt.*, Ergänzungsheft 258 (1955), 88–99.

[2] In 1950 there were 373,482 hectares of land under cultivation in Spanish Morocco. *Anuario estadístico, 1952–53*, p. 91, cited in note 1.

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tradition that rye could be grown on unclaimed land, beyond the reaches of ordinary agriculture.[4]

Hunger or plenty depends largely upon the success or failure of the cereal crop. Tree and garden crops supplement but never supplant the cereals. The most important secondary crops are from fruit and nut trees, which are especially numerous in the western part of the Rif. The most important are the olive, pomegranate, fig, and walnut. Apples and plums are grown by some of the highland tribesmen, who graft them on hawthorns. At lower elevations, especially on south-facing slopes, orange, peach, and apricot trees are occasionally seen.

Dried figs and raisins are second only to the cereals as staple foods. The importance of the trees is indicated by the complicated pattern of their ownership. On a given farm, all the trees may belong to an outside party, perhaps the former owner of the land who refused to relinquish title to his trees. One tree may be owned by several people in partnership, and sometimes different people own different branches, or claim parts of the crop on the ground. At one time the Rifians seem to have used grapes or other fruits to make fermented beverages, for Leo Africanus describes them as being "so excessively given to drink, that they scarcely reserve wherewithal to apparel themselves."[5]

Irrigated plots in the valleys of Wad Ghis and Wad Nkour produce broad beans, chickpeas, potatoes, onions, tomatoes, peppers, carrots, turnips, and squash. Add eggs, and an occasional feast of mutton or goat meat, and you have the main ingredients of the Rifian diet. In recent years fish have been brought in from Alhucemas to the principal rural markets. Fish are regarded as a delicacy, and are usually fried and eaten in the market place.

West of the Rif the dietary situation improves, but it becomes more hazardous toward the east. This distinction is based on the differences in precipitation and runoff. In the eastern lowlands, precipitation is too meager for vines and figs, and extensive irrigation is possible only in the valleys of Wad Kert and Wad Moulouya. The tribesmen of Garet suffer from acute want in any unusually dry year, and most adults remember at least one famine. Garet and Gal'aya are northern Morocco's main areas of emigration.

In the Sanhajan highlands and in most of Ghmara and Jbala, each hamlet has a reliable source of irrigation water. The main irrigated crops are maize, beans, and squash. The planting of beans between the rows of maize may indicate an unformulated appreciation of the value of pulses as restorers of the nitrogen content of the soil. Perhaps not; for the plants in this New World combination seem to have been introduced as one complex by Andalusian refugees.

In most of the central highlands, and especially in Sanhaja as-Srair, *kif*, or hemp (*Cannabis sativa*), is an important cash crop. It is grown under irrigation during the summer, and is usually planted and harvested at about the same time as maize. After it has been reaped, the stems of the plant are submerged in a stream and held down with stones. After two or three days of soaking, the fibers are separated and used to make cord, mats, and baskets.

Traveling from the central highlands toward the Atlantic lowlands, one notes

[4] C. S. Coon, "Tribes of the Rif," *Harvard African Studies*, 9 (1931), 47–48.

[5] Leo Africanus, *The History and Description of Africa* (London: Hakluyt Society, 1896), II, 516.

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of Garet. In the Atlantic coastal zone most of the surface is cultivated, and little vegetation is left to serve as browse. In the eastern plains goats are replaced by sheep, which begin to outnumber them in the lower parts of the Rif. In the Middle Atlas the raising of sheep is associated with transhumance. This mode of pastoral life is still followed to some extent by the Ulad Stut, Aith Bu Yihyi, and Ibdharsen, who spend the winter months near their cereal fields and the summer months in higher country with their sheep. The routes of migration run from the alluvial lowlands into nearby hills, especially the Kar-Kar range. In recent years the development of new irrigation projects has discouraged pastoral life, and the migration is now limited to a few of the young men and boys.

In the western provinces the main draft animals are cows or oxen. In the highlands and in the eastern lowlands the beasts of burden are donkeys and mules, which are used also for threshing and turning olive grinders. Mules are highly prized, for they can carry a heavier load than donkeys and are more agile and hardy than horses. Since there are few horses in the northern zone, most mules are imported from elsewhere in Morocco or from Spain. Moroccan donkeys are a small but hardy race, able to withstand long journeys with heavy loads. Horses have little value except as symbols of wealth and prestige, and are seldom used in the mountains. At the time of the Spanish conquest there were no horses at all in Aith Bu Nsar, Aith Seddath, and Aith Khannus.[18] Camels are restricted to the plains of Garet, where about 2,000 of them are used as milk, pack, and draft animals. Except for an occasional playful experiment, camels are not ridden.

The pack saddle for donkeys and mules is a heavy object made of cloth stuffed with straw. Panniers of twilled basketry, consisting of a double container connected by a strip of basketry, serve nearly all transport needs. Riders perch on top of the load and let their legs dangle to one side. There is little riding in the mountains, for a healthy man can make better time on foot.

Women are the most important burden bearers. Lines of women or girls bent under heavy loads are a common sight everywhere in Morocco. In Jbala they may be seen on any road carrying huge loads of wood and charcoal (pl. 8, *b*).

The domestic animals in northern Morocco include ferrets used in hunting, dogs, cats, and chickens. The dogs are of two types, one a small cur and the other a larger sheep dog. Chickens are the exclusive property of women, who sell them and their eggs independently of their husbands. Bees are kept in the mountains, but the average tribesman knows nothing of apiculture, and prefers to assign the task to paid specialists.

Irrigation and Water Rights

In Moroccan agricultural terminology the most important distinction is that between *bilad bour*, the land of dry farming, and *bilad saqiyah*, the land of irrigation. By far the greatest amount of irrigated land is watered by diversion of surface runoff (pl. 5, *b*). Small dams (*mechra*) are used to divert water into ditches (*saqiyah*), which lead to the irrigable land. The ditches often follow tortuous contours, and may extend for several kilometers. The larger streams are flanked by several channels, sometimes five or six, each bringing water from a

[18] Coon, "Tribes of the Rif," p. 89, cited in note 5.

A, [See p. 132--Analyst]

B, [See p. 129--Analyst]

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different dam. In deep valleys it is often necessary to move water back and forth across the natural drainage lines. For this purpose, wooden conduits are set on long tripods. Construction of irrigation works begins in the spring, and after a few months of use the water is redirected into its natural course. Since water is required only during the dry season, irrigation systems are designed for the minimum runoff. On steep slopes, water is carefully directed into a series of ponds; check dams are used to impound water from springs. Channels are constructed to lead water to grist mills, but the use of water for milling has a low priority, for most communities also have smaller mills turned by hand.

The construction and maintenance of dams and irrigation ditches require less effort than the construction and maintenance of terraces. With the exception of a few works in the coastal plains, terracing is necessary for irrigation. Since irrigation involves channeling rather than simple flooding, most terraces have a slight slope and are supported by stone walls (pl. 6, *b*). There is no rotation of crops on irrigated land. In areas of thin residual soil the land is gradually built up by the constant deposition of baskets of mud, another of the backbreaking tasks assigned to the women. Fertilizer, a mixture of sheep dung and ashes, is applied each year.

The regulation of water rights is a complicated matter.[114] The rights of preference pass from human beings to animals, crops, and industries. The two main rivers of the Rif, Wad Ghis and Wad Nkour, illustrate the problems of management. Wad Ghis has only about a fourth of the flow of Wad Nkour, but its flow is more predictable. Those who irrigate with its waters know the quantity they can expect, and plan accordingly. In normal years Wad Nkour irrigates nearly ten times as much land as Wad Ghis, but in some years it remains little more than a muddy trickle. Hence there is frequent occasion for disputes, which in the past often led to prolonged feuds. In both basins the mountaineers have almost unlimited use of water, while the more numerous plainsmen must be satisfied with what is left. Most Rifian communities have secondary sources of water: wells, springs, and ponds. Each family is allowed a certain time at the water source, and the community as a whole works out the regulations and fines.

An elaborate series of agreements, usually verbal, deals with the construction and maintenance of irrigation works. The labor of construction as well as the necessary reconstruction after heavy rains is done by representatives of the families using the water. Infractions of agreement often lead to differences of opinion about these responsibilities or the period of time water is used. Serious disputes may arise over the outlines of ditches, and for this reason it is necessary to gain the consent of each property owner over whose land the water is to flow. The irrigation turns of the larger communities are regulated by days. Within such communities, individual families are allowed shorter periods of use, usually an hour. The mechanics of irrigation requires the use of the hoe to build up and then destroy a tiny diversion dam.

[114] In this section I have made use of J. M. Paniagua y Santos, "Notas sobre el derecho consuetudinario de la propiedad en el Rif," *Archivos del Instituto de Estudios Africanos*, 4 (1948), 7–44; D. M. Hart, "An Ethnographic Survey of the Riffian Tribe of Aith Wuryaghil," *Tamuda*, 2 (1954), 55–67; and D. A. Caponera, "Water Laws in the Moslem Countries," *FAO Development Paper 43* (Rome: Food and Agricultural Organization of the United Nations, 1954).

[See p. 130--Analyst]

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Contracts and Coöperation

675 469 171 241 When tribesmen are unable or unwilling to work their own land, contracts are made between the wealthier and the poorer members of a community; those who have little land or equipment hire themselves out to those who have more. Farmers who have more animals than they or their sons can manage, make agreements with others to care for the herd. The hired shepherds, while the animals are in their hands, receive part of the milk and butter, some of the young that are born, and, if the animals are sold, a share of the profit. The shepherd receives part, sometimes half, of the wool. Full-time employment as a shepherd is considered rather degrading, and for this reason it is the common occupation of exiles and orphans.

Vegetable gardens, orchards, and fields may be cared for by hired laborers. If their job entails the difficult task of setting up terraces, they may get up to a third of the crop. If they perform all the operations necessary for cereal cultivation, they receive a fifth of the crop. If the hired hand needs an assistant during the reaping, the latter is paid with a tenth of the harvest. Associations of this sort are not common; farm labor is ordinarily done by the landowner and his sons.

476 241 171 A second type of association takes place when two farmers own plots of about the same size but do not have enough animals or equipment to work their land independently. The two farmers join forces, each supplying his share, and the harvest is divided between them. This form of coöperation is common when a farmer has only one draft animal. In irrigated areas, one man may supply the land and part of the seed, and another the rest of the seed, the animals, and the plow. Since most communities are kinship groups, coöperation of this sort is usually among brothers or cousins."

Inheritance

428 171 The inheritance of property[114] in most of Morocco follows standard Maliki practice, which allots a share to each son equal to that falling to two daughters. When a man dies his widow first receives one-eighth of his property and the remainder is divided among the sons and daughters. All sons inherit equally, as do all daughters. If a man dies leaving a widow and daughters only, the widow gets one-eighth and the remainder is divided into three parts, of which the daughters receive two and the father's brother one. If the father has no brothers, the rest (aside from the widow's share) goes to the daughters. If he does have brothers, and dies leaving only one daughter, she receives half of the property (minus the widow's share) and the brothers get the other half. If a man dies leaving no children, his widow receives a fourth of his property and the rest goes to the brothers. If a man with children dies prior to his father, the children have no right to the property and receive shares only if the grandfather agrees to such a division.

[423] Moroccans are very reluctant to divide up their land. When brothers inherit land they customarily work it jointly, the eldest brother acting as a substitute

[113] [114] On contracts and coöperation, see also A. Sánchez Pérez, "Aprovechamientos comunales y formas de cooperación en el Rif," *Selección de conferencias pronunciadas en la Academia de Interventores durante el curso 1950–51* (Tetuán: Imprenta Cremades, 1951), pp. 95–104.

[113] [114] This paragraph is based upon the remarks of D. M. Hart in *Morocco: Subcontractor's Monograph* (New Haven: Human Relations Area Files, 1956), pp. 141–143.

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The introspective character of rural Morocco is enhanced by the weekly trading market or *suq* (plural *aswaq*). These markets attract urban merchants, craftsmen, and entrepreneurs, but their principal function is to serve as outlets for the products of local specialization. One family comes to market with a basket of figs, and another with a pannier of walnuts. After an interval of haggling, each leaves with the specialty of the other. Exchange of this sort helps to add variety to the diet, and encourages an intelligent appraisal of local conditions of soil and climate. Staple foods seldom enter into this exchange. The goal of each community is to be self-sufficient in breadstuff. A few commodities, such as sugar, salt, tea, and kerosene, are imported from the cities, but the chief function of the weekly market is to satisfy the modest wants of dispersed communities engaged in subsistence agriculture.

Markets are held in the open, at predetermined sites that are deserted during the rest of the week. In each tribal area one or more sites are reserved as market places and named as follows: *had* (Sunday), *tnine* (Monday), *tlata* (Tuesday), *arba* (Wednesday), *khemis* (Thursday), *jema* (Friday), and *sebt* (Saturday).[a] On the morning of the appointed day, streams of people converge on the market place. The *suq* is much more than a market in the economic sense of the word; it is also a social and political assembly of great importance in tribal life. Market day is the time for legal transactions and all manner of negotiation. By nightfall tribal authorities have resolved most of the problems of the week.

There is great variation in the size and influence of markets. In 1949 authorities of the Spanish protectorate made a study of the volume of business transacted at each *suq*. About a hundred markets were located; the annual volume of business, including barter, averaged about 10,000,000 pesetas per market. About a fourth of the markets had an annual business estimated at more than 65,000,000 pesetas (table 5). Most of the larger or regional markets are in the populous Rif (fig. 24). In the sparsely settled area of Sanhaja as-Srair, only one market, Tlata Ktama, serves as a trading center for more than one tribe. Khemis Izagan (pl. 7, *b*), with trade estimated at 3,000,000 pesetas, is typical of the smaller local markets.

Each market has four main functions: (1) distribution of local products, (2) exchange of rural surpluses or specialties for urban goods, (3) circulation of articles such as pottery and millstones from villages which specialize in making them, and (4) dissemination of foreign imports. The larger markets differ from the smaller in their greater emphasis on the latter two functions. Moreover, the larger markets are usually located at the convergence of communication lines and on the frontiers of complementary production zones.[b]

Emigration

Unfortunately, the weekly markets do not compensate for uneven distribution of population and productive land. Few communities are able to accumulate

[TEXT CONTINUED ON PAGE 93]

[a] On French maps the names of the days of the week appear as *had, tnine, tleta, arba, khemis, djemaa,* and *sebt;* on Spanish maps the usual spellings are *had, tenin, telata, arbaa, jemis, yumaa,* and *sebt.*

[b] On the location and function of markets and the changes caused by recent improvement in communications, see M. W. Mikesell, "The Role of Tribal Markets in Morocco," *Geog. Rev.*, 48 (1958), 494–511.

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surplus food for lean years. Many tribesmen, especially the Rifians and the inhabitants of Garet and Gal'aya, live under the constant threat of famine. Every failure of the cereal crop causes great suffering. Even with resources developed to the limit, these areas would still be unable to provide full employment or full nutrition for their expanding populations. The rate of population growth through-

TABLE 5

VALUE OF TRADE AT REGIONAL MARKETS IN 1949

Market	Volume of trade (pesetas)
Jbala—Lukkus	
Sebt Bani Said	43,000,000
Tlata Jbil Habib	89,000,000
Jema Zinat	80,000,000
Khemis Anjra	60,000,000
Tnine Sidi Yamani	117,000,000
Tlata Reisana	102,000,000
Sebt Bani Gurfat	82,500,000
Arba Aicha	68,500,000
Ghmara—Sanhaja as-Srair	
Had Bani Dercul	57,000,000
Tlata Bani Hmid	84,000,000
Tlata Ktama	65,000,000
Arba Targist	166,000,000
Rif—Qaret—Gal'aya	
Tlata Aith Hadhifa	88,000,000
Arba Turirth	122,000,000
Tnine Aith Bu Ayyash	109,000,000
Tnine Aith Ammarth	65,000,000
Arba Aith Sidar	105,000,000
Khemis-Jema Driuch	138,000,000
Khemis Ain Zorah	107,000,000
Had-Tlata-Khemis Thimsaman	240,000,000
Tlata Ikibdhanen	104,000,000
Had Jbil Arruwi	101,000,000
Tnine-Khemis Thafarsith	78,000,000
Khemis Zaio	90,000,000

SOURCE: J. Caballo Alcaraz, *Apuntes de geografía de Marruecos* (Tetuán: Editora Marroquí, 1951), pp. 167-169.

out northern Africa must be described as alarming. In Morocco the mean annual increase is 1.5 per cent. This rapid increase creates serious economic problems, all the more so on account of the youth of the population, of whom 41 per cent are less than fifteen years old.[a] The spread of preventive medicine and the persistence of such social practices as early marriage and easy repudiation of sterile wives accentuate this trend. The cultivated area of northern Morocco has doubled in the last three decades,[b] but many tribes still find it impossible to grow enough food.

[a] Nevill Barbour, ed., *A Survey of North West Africa (the Maghrib)* (London and New York: Oxford University Press, 1959), p. 81.
[b] *Anuario estadístico, 1952–53*, p. 91, cited in note 1.

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High Atlas. Deforestation can be traced also to the tanners of Fez and Tetuán.[112] The tanners' guild in Fez goes back to the ninth century, when master tanners gathered at this site from Córdoba, Qayrawan, and distant Iran. Fez leather was once exported as far away as Baghdad, and shoes went to Egypt until the present century. During the peak years of production, Fez craftsmen tanned about 500,000 skins a year. The descendants of the original immigrant craftsmen are still busy making handbags, slippers, and other articles for the tourist and export trade.

It is not surprising that *Quercus Ilex*, an important source of tannin, should now be rare in the hills near Fez and Tetuán. There is good reason to believe that the holly oak once covered these hills. One well-informed botanist asserts that the primordial cover of the limestone mountains south of Tetuán probably was a "climax" forest of holly oak.[113] In Gal'aya and the eastern Rif, careless stripping of the bark of *Rhus pentaphylla*, a source of red dye, destroys many trees; "Morocco leather," a trade name in bookbinding, is customarily made from goatskin tanned with sumac.

Effects of Burning

In the eastern Rif the plant cover is usually too sparse to maintain a fire, and on the Atlantic littoral there is little land left to clear. But between these areas is a large zone covered with forest or scrub that must be burned before the land can be plowed. Some attempt is usually made to control the spread of fire, but conflagrations develop when tinder-dry shrubs are fanned by brisk winds. Fire is employed also for the "improvement" of pasture, for increased blossoming ("bee pasture"), and probably for the mere pleasure of burning or out of carelessness.[114]

The importance of pastoral fires has been emphasized by most students of the Mediterranean landscape,[115] but in northern Morocco fires set to clear away noxious shrubbery or to facilitate movement of stock are less important than agricultural fires. Pastoral fires are neither necessary nor desirable where there are goats, for these animals thrive on woody browse and can break through the thickest scrub. Sheep outnumber goats only in the drier eastern sector, where impenetrable formations are rare. For every fire set to "improve" pasture, probably more than ten are set to prepare new fields for plowing.

Whatever its cause, fire is a major agent of deforestation. The difficulty is that there are many kinds of fires: quick fires that run over a thin mantle of vegetation, great conflagrations that consume thicker formations, fires that remain close to the ground, fires that extend to the crowns of trees. It makes a great deal of difference whether fires recur after five or after twenty-five years. Moreover, the important factor may be not the fire itself but what happens to an area after it has been burned.

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[113] [112] R. le Tourneau, L. Paye, and R. Guyot, "La corporation des tanneurs et l'industrie de la tannerie à Fès," *Hespéris*, 21 (1935), 167–240; A. Joly, "L'industrie à Tétouan," *Archives Marocaines*, 8, 15, 18 (1906–1912).

[113] [113] J. Ruiz de la Torre, *El matorral en Yebala (Marruecos español)* (Madrid: Instituto de Estudios Africanos, 1955), pp. 26–27, and the map showing the "natural area" of *Quercus Ilex*.

[113] [114] H. Marc, *Notes sur les forêts de l'Algérie* (Paris: Larose, 1930), p. 396, lists the causes of serious forest fires from 1886 to 1915 as "accidents" (8 per cent), "imprudence" (32 per cent), "intentional" (23 per cent), "unknown" (37 per cent).

[113] [115] G. Kuhnholtz-Lordat, "Influence des feux pastoraux dans la région méditerranéenne," *Jour. d'Agriculture Tropicale et de Botanique Appliquée*, 3 (1956), 785–791.

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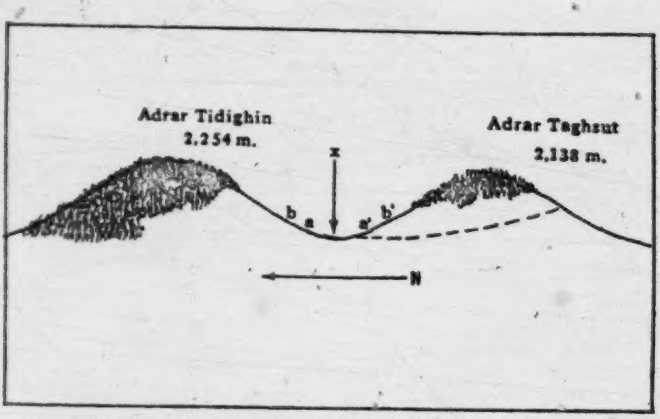

Fig. 28. Position of cedar forests in relation to land use on Adrar Tidighin and Adrar Taghzut: *a*, *a'*, zone of irrigated terraces; *b*, *b'*, zone of dry farming; *x*, location of protected cedar.

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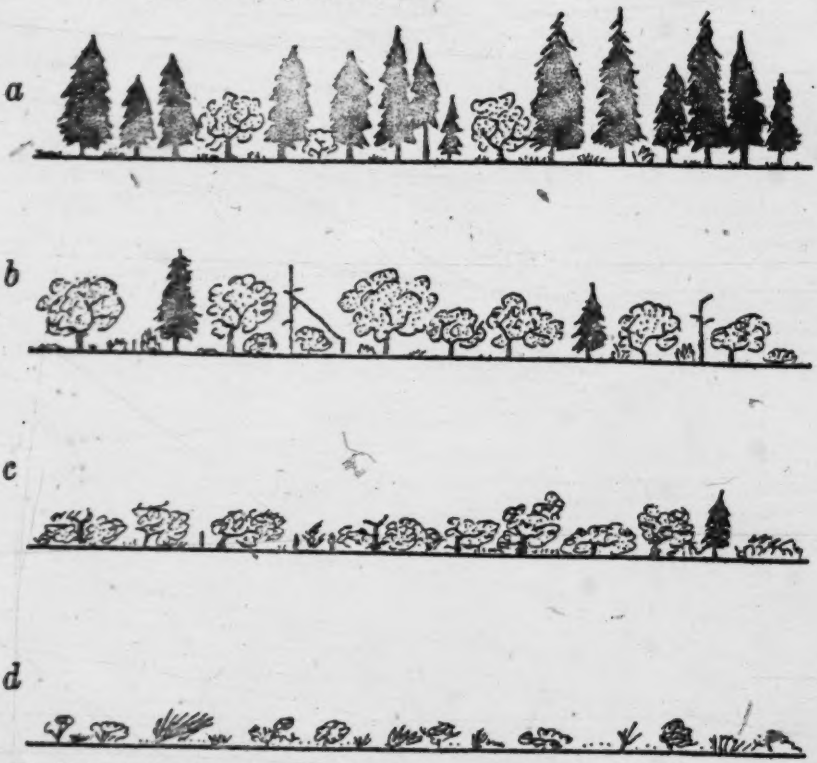

Fig. 29. Stages in retrogression of a cedar forest near Tlata Ktama (elevation about 1,500 meters): *a*, undisturbed forest; *b*, mixed stand of cedar and oak; *c*, secondary scrub oak formation; *d*, tertiary scrub formation without oak.

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3
Jebala MX2

practice to allow sheep to graze on stubble, many slopes are completely bare when the first rains fall. Erosion is retarded during spring and summer when a part of the runoff is diverted into irrigation ditches, but the irrigation systems promptly disintegrate at the beginning of the rainy season, and runoff again follows the network of gullies (pl. 11, *a*).

Gullying is most severe in the hilly areas of the Rif. The basins of Wad Ghis, Wad Nkour, and Wad Kert show an intricate pattern of short, steep slopes. "Ghis" means "mud" in Arabic, and most of the mud comes from the denuded highlands. The lower course of each river is joined by deeply entrenched tributary streams cutting through old fans and terraces. In Targist, Thimsaman, and Tafarsith the best farms are on fragments of Pliocene conglomerate, isolated from one another by deep ravines. Badland topography covers most of the area between Wad Nkour and Wad Kert. This may be described as an erosion-induced hoe-culture, for slopes are so badly dissected that it is no longer possible to use plows. The desperate effort to produce grain is abandoned only when the harvest does not repay the investment in seed. Cereals are sown in gullies and on nearly vertical slopes. The Spanish learned to their dismay that hungry Rifians try to cultivate even the roadbeds. The plains of Garet and the lower Kert constitute islands of alluvium in a sea of denuded terrain. Serious erosion becomes evident as soon as one passes to older terrace and residual soils. The hills of Ikibdhanen and the volcanic eminence of Gurugú are as bare as the limestone peaks.

The pattern of gullies and rills continues into the hills of Jbala and Ghmara, but the most serious problem in these areas is sliding. The roads from Tetuán to Tangier and Shawen are blocked by slides every year. In Anjra and Fahs one is never out of sight of a slide scar. Gullying is less serious than in the eastern sector, but streams are slightly entrenched even in the rolling country south of Tangier, and the marine terraces between Arcila and Larache are cut by deep barrancas.[13]

[13] René Raynal, "Bodenerosion in Marokko," *Wissenschaftliche Zeitschrift der Martin-Luther-Universität Halle-Wittenberg*, 5 (1956–1957), 885–894.